Empowering champions of innovation and change in large healthcare organisations using human-centred design

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By

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Shaping, conducting, and finally writing up this research has taken me on a journey from empowerment to bewilderment to exasperation to amazement, and back again. It has opened up a world to me that previously felt out of reach, and to be able to pair this empirical research journey with a lifetime of practical experience in healthcare? Well, I'm one lucky person. I know this journey has taken a village of advocates and partners, faith, and friendships. Family, friends, colleagues, and even neighbours have come along and helped in more ways than I could capture here.

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This is for all those who work hard and take chances to pursue a dream, and to all of those who help lift them high enough so they can actually reach it.

Now go change the world.

Christi Dining Zuber, September 14, 2017

Abstract

The rising cost of healthcare and the inability to provide the adequate care and access needed for an ageing and a more complex patient population are putting systems around the world under pressure to change. Healthcare is inherently risk averse (Cresswell, Cunningham-Burley, and Sheikh 2017) and has a complex infrastructure that resists change (Chin et al. 2012; Christensen, Bohmer, and Kenagy 2009). It has been stated that a key approach to addressing these issues is to equip healthcare organisations and a workforce within them with the capabilities to innovate (Berwick 2003; Bohmer 2010; Coughlan, Suri, and Canales 2007; Weberg 2013). Research has focused on how human-centred design (HCD) can be used as an approach to build innovation capability within organisations (Carlgren 2013b), but there is limited study of individuals using and developing HCD for innovation in the context of their work environment (Carlgren, Elmquist, and Rauth 2014; Carlgren, Elmquist, and Rauth 2016a; Liedtka and Ogilvie 2011; Seidel and Fixson 2013), particularly in healthcare (Berwick 2003; Bohmer 2010; Coughlan, Suri, and Canales 2007; Roberts et al. 2016). These gaps create challenges when attempting to address the pressure to change in healthcare. The aim of this research was to explore and create actionable approaches for leaders of change to build this capacity to learn and apply HCD to champion innovation and transform healthcare.

To do this, the research presented sought insights that could be applicable across a wide diversity of backgrounds and organisational roles to broaden the scope and reach of these change agents. This research conducted three different studies across a range of individuals from novices through to those who had over a decade of experience in learning and successfully applying HCD for innovation within large organisations.

The first study aimed to understand the conditions that enabled those inexperienced in organisational innovation and design to champion innovation and change more broadly. A total of 125 nurses took part in a workshop and empathy map-based study. The results surfaced seven key enabling conditions to champion innovation and change from the nurses' viewpoints.

The second study conducted semi-structured interviews and user-led journey map exercises aimed at understanding the approaches taken by 15 successful exemplars across a broad range of industries. The goals surfaced commonalities in how they

navigated the complexities of HCD for innovation in an organisational setting. The results indicated common themes in conditions and behaviours displayed.

To provide a real-time “in-the-wild” view into learners’ development and responses to organisational context, a third study was undertaken longitudinally over a twelve-month period. In this study, new HCD learners and those responsible for mentoring them were observed during a series of integrations with their coaches and peers both virtually and in person as they worked to actively apply HCD within their healthcare organisations. The transcribed interactions were thematically analysed to produce a new view of learning in this field.

The findings across the three studies were brought together to generate a novel set of interactive and actionable theoretical models. First, a design competency model creates an innovative approach to codify and track the developmental journey of new HCD learners. Second, a microclimate model and roadmap provides a new codified set of conditions and behaviours for developing HCD within a large organisation’s workforce directly from the experiences of exemplars in the field.

To date, studies have focused on how organisations overall can create structures to support innovation and design, leaving little guidance for individuals who want to help lead innovation and change within the workforce. These results make a significant contribution by providing tools inspired and shaped by user experiences to empower healthcare leaders to approach the needed changes in new and novel ways.

The thesis recommends future work in the development of curricula to support competency development along the newly defined stages of learning and in the testing of these tools in organisations over time to track the impact and outcome.

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Dissemination as a result of work from this thesis

Journal paper

Zuber, C., and Moody, L. (forthcoming 2018) “Creativity and Innovation in Healthcare: Tapping into Organizational Enablers through Human Centered Design”. *Nursing Administration Quarterly*

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Zuber, C. (2018). “Designing the Future of Nurse Leadership through HCD”. Stanford’s Healthcare Research and Educational Conference, Palo Alto, California, March 27, 2018

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Zuber, C. (2016) “*Design for Empowerment”,* The Conference Board Innovation Council, Basking Ridge, New Jersey, May 23, 2016

Zuber, C. (2016) “*Design for Empowerment”,* Innovation Learning Network, Storytelling 2.0, Chicago, Illinois, May 9–11, 2016

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Zuber, C. (2014) “*Innovate like a Boss, Developing Microclimates for Innovation*”, Innovation Learning Network, X:1 All Things Innovation, Oakland, California, May 10-12, 2015

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List of abbreviations

CCI	Center for Care Innovations
DMI	Design Management Institute
DT	design thinking
HCD	human-centred design
HHS	Health and Human Services
HMO	health maintenance organisation
IRB	Institutional Review Board
KP	Kaiser Permanente
NHS	National Health Service
OD	organisational development
PHI	protected health information
UHCP	Union of Health Care Professionals
UNAC	United Nurses Associations of California
UHW	United Healthcare Workers
US	United States (of America)

Glossary of terms

Capability/capabilities: the ability to conduct an action to achieve a desired outcome. In this research, it is often referred to as innovation capability or an organisation's ability to approach challenges in a way to create innovations.

Catalyst: a new learner in human-centred design who is participating in the "Innovation Catalyst programme" to learn HCD approaches to innovation.

Change agent: a person inside or outside an organisation who helps to lead in organisational change and transformation. A majority of change agents in this research were also experts in the application of HCD as they utilized the methods to lead change within their organization.

Competency: the ability to do something successfully. In this research, it is often referred to in the context of design competency or the ability to successfully use human-centred design methods.

Design: For this research, design is related, but different, from human-centred design. Design, as a study, develops through the liberal arts and often leads to the creation of a designed object or experience by an individual trained as a designer. The output may, or may not, be designed in a human-centred way using the methodologies of human-centred design.

Expert: a person who is highly knowledgeable or has a notable skill in a particular area, referred to often in this research in the context of an expert specifically in the application of human-centred design skillsets and mindsets within an organization. Experts in this research are practitioners in human-centred design and were identified as experts from overlapping agreement among business and academic journal mentions, conference speaking engagements, and select innovation and design council membership focused on industry application of human-centred design. Some of the experts within this research are studied in their role as organizational change agents and others are studies in the role as coaches to new learners in the Innovation Catalyst programme.

Exemplar: a person looked to as a model of a certain behaviour or topic area. Exemplars in this research are used in the context of those who are seen to have achieved a high state of expertise in developing human-centred design and innovation within an organisational setting.

Human-centred design: For this research, human-centred design is defined as "a human-centred innovation process that emphasises observation, collaboration, fast learning, visualization of ideas, rapid concept prototyping, and concurrent business analysis, which ultimately influences innovation and business strategy … a methodology for innovation and enablement" (Lockwood 2010: 6). An additional hallmark of this embodiment of human-centred design is that it can be learned and applied by multidisciplinary teams to address complex challenges such as those found in healthcare.

"In the wild": an uncredited term used in literature that positions the research outside of a controlled laboratory setting, instead placing it in a local context with those whom it would affect. The research taking place in the wild in the context of this body of work most often applies to the fact that it is occurring with people and through experiences that would already be taking place if this research was not being conducted.

Improvement: an approach to reach a higher level of system performance, often through the enhancement of existing solutions.

Innovation: an approach to introduce new ideas, processes, products, or procedures, often accomplished using human-centred design in this body of research.

Kaiser Permanente: a healthcare organisation in the United States that serves as a key source of observation. For more information on KP, see Section 1.1.2 and 2.2.3.

Payor: any legal entity responsible for handling payment claims for healthcare services in the United States under a state or federal medical assistance programme.

Psychological safety: a shared belief that the team is safe for interpersonal risk taking. It can be defined as "being able to show and employ one's self without fear of negative consequences of self-image, status or career" (Kahn 1990: 708). In psychologically safe teams, the team members feel accepted and respected, which is seen as a key component for innovation in this research and in the literature at large.

Learner: a person who is learning a new subject or skill, often referred to in this research in the context of a novice learner, a learner who is in the early stages of learning, or an expert who is at the highest level of learning a new subject or skill.

Novice: a person new to a situation, often referred to in this research in the context of a "novice learner" in human-centred design.

Organisational development: a theoretical field of study that focuses on the process of changing an organisation's strategies, processes, procedures, and culture.

Safety net: a term used in the United States to describe the system of healthcare facilities and providers that aid those who cannot afford to purchase healthcare insurance.

Scaffolding: the creation of early-stage ideas or artefacts that are intended to be further enhanced or developed by others.

Thought leader: a person who has a strong understanding of a particular body of knowledge and likely seen as a contributor to new knowledge in that field. In this research, the thought leaders are those who research and contribute to knowledge specifically in the fields of human-centred design and innovation.

United States of America: a country in North America where a majority of this research took part.

Chapter 1: Introduction

1.1 Context of the thesis

With the heightened issues of rising cost and limited resources in healthcare comes the need to develop a workforce equipped to lead the creation and development of innovative change. The focus of this research was to look at a spectrum of individuals from beginners through to those with over a decade of experience learning and applying human-centred design (HCD) to innovate within large organisations with a particular focus on healthcare. The goal was to better understand the experiences of the individuals trying to innovate and lead innovation through HCD, what enables the learning and application of HCD within organisations, and the context that best supports empowering healthcare innovation of this nature within the workforce.

HCD is established as an approach that has the needs of the user at the centre of the process as a core principle (Brown 2008; Carlgren, Elmquist, and Rauth 2016c; Liedtka and Ogilvie 2011; Martin 2011; Seidel and Fixson 2013). Another important attribute is that it is presented as an approach to innovation that non-designers or multidisciplinary work teams, like those who make up the healthcare workforce, can learn and apply (Seidel and Fixson 2013; Liedtka and Ogilvie 2011; Roberts et al. 2016). As noted in Chapter 2, the creation of innovation capacity should be supported by processes that can be understood and practised by individuals within the organisational workforce (Berwick 2003; Carlgren 2013b; Carlgren, Elmquist, and Rauth 2016a), and HCD meets that criteria. Capacity, particularly when it is related to job functions, needs to be contextualised to the work environment and how it impacts and is impacted by that environmental context (Beckman and Barry 2007). While HCD is stated as a potential innovation process fit for an organisational workforce, little has been done to study the needs or conditions that can aid in its actual development within the environment of organisations (Carlgren 2013b; Carlgren, Elmquist, and Rauth 2014; Seidel and Fixson 2013). This research therefore sought to address this issue, particularly within the healthcare setting.

A note on the author

> *I am a nurse, hospital administrator, and business consultant, and over the past 15 years, I have become a practitioner and thought leader in HCD. I have created a successful HCD practice within a $40 billion US healthcare organisation with over 200,000 employees. Our work has been promoted in academic publications*

(Carlgren, Elmquist, and Rauth 2016a), PhD thesis case work (Carlgren 2013b; Rauth 2015), and popular press pieces ranging from the Harvard Business Review *to the* New York Times *(Brown 2008; Cain et al. 2012; Lin et al. 2011; McCreary 2010; Liedtka and Ogilvie 2011), yet we still found the work challenging. I, like many others, have worked hard to lead as an agent of change and pave a path to develop this practice, despite an overall organisational culture unfamiliar with HCD and risk averse to innovative efforts.*

There is a great deal of work to do in this industry, and I believe that HCD has the potential to help create solutions for patients, family members, and the staff and clinicians who provide their care. HCD methods have been used to help create processes that make conversations between patients and physicians more clear and productive, to reduce frustrations over waiting room experiences, to create hospitals that are safer for patients, and to develop community networks that better serve an ageing society.

These possibilities excite me, and still, I have a great deal to learn. I have developed a successful HCD practice for innovation though a great deal of trial and error, sometimes with more error than I would like to admit. This body of research was conducted in an attempt to better understand how HCD is learned and applied within organisations so that other leaders of change in healthcare can benefit and perhaps even experience fewer mishaps along the way as we all help do our part to help transform healthcare for current and future generations.

Before going further, context about healthcare in the United States (US) is provided as a backdrop for this research. It gives a basic understanding of the structure of US healthcare and some of the key challenges within the industry.

1.1.1 Healthcare context in the United States

This research explored the use of HCD across a range of industry settings, with a particular focus on healthcare in the US. A brief history of US healthcare is provided here, with an overview of a primary case study organisation, Kaiser Permanente (KP).

Healthcare in the US, as in a few other countries like France, relies heavily on private insurers and is primarily associated with an insurance benefit subsidised by an employer or care that is supplemented through government programmes such as Medicare and Medicaid (Fillmore 2009). This is in contrast to the United Kingdom's (UK's) model of an archetypal health service, by which the majority of medical care

facilities and personnel costs from doctors and other caregivers comes directly from the government treasury (Chari et al. 2012).

The basic structure of the US healthcare system includes providers such as hospitals, doctors, pharmacies, and so on, as well as payors. Payors, as identified in the US, are those entities that are in the business of setting and processing insurance claims and payments. Payors are most often insurance companies, which are subsidised by a person's employer, as mentioned earlier. Government healthcare benefits from Medicare and Medicaid are the next most common payors after employers, followed by individuals who may try to pay for their own care or have no access to insurance (Catlin and Cowan 2015).

There is discourse about the tension in US healthcare, developing from the fact that most doctors and hospitals make money when people are sick, and conversely, most employees and insurers make money when people are healthy and productive (Christensen, Grossman, and Hwang 2009). These opposing priorities create an environment of unaligned incentives and potential challenges when creating and implementing changes (Christensen, Grossman, and Hwang 2009).

One model of care provision in the US is the health maintenance organisation (HMO), by which the providers and the insurance company payors are linked and paid for by either an employer, an individual, the government, or a combination of all three. In this model, the HMO insurance dictates which providers an individual is allowed to receive care from through their insurance plan. KP, one of the key case studies in this research, is considered an HMO. Simply stated, if you have KP insurance, you receive care from KP providers. KP is unusual in the US because it is an integrated delivery system. This means that KP as an organisation includes insurance, physicians, and other care and service providers, including hospitals and clinics, within its healthcare system. Another key model in the US, similar to KP, is Veterans Affairs, which provides care solely to military veterans and their dependents.

According to the World Health Organization (WHO 2016), the cost of the US health system in 2014 amounted to $9,403 (£14,668) per person, compared to the UK's cost per person of $3,377 (£5,268). Despite the spending, the World Health Report (WHO 2000), *Health Systems: Improving Performance,* ranked the US healthcare system 37th in the world, and furthermore, it ranked the US first in terms of healthcare spending. The Institute of Medicine (2003) stated that the US performs poorly on several determinants of health, such as infant mortality and life expectancy (Andersen and

Newman 2005; Murray et al. 2010), which has continued in recent years. The high rate of uninsured is believed to be a contributing factor (Freeman et al. 2008).

Still, changes are being made in areas such as policy reform. A relatively new change in the US healthcare landscape is the Affordable Care Act, which aims to reduce the uninsured population. Beginning in 2010, it has reduced the number of uninsured individuals from 16% of the US population in 2010 to 9.1% of the population in 2015 (Obama 2016). This demonstrates a radical shift in the way healthcare is funded for a significant portion of people within the US, but the underlying approach to how the care is provided remains the same. The need for more health promotion and disease prevention, as well as complex and competing incentives within healthcare reimbursement, make healthcare an industry that is still very much in need of innovation (Bessant and Maher 2009; Roberts et al. 2016) but is challenged to create it within its own workforce (Berwick 2003; Carlgren, Elmquist, and Rauth 2014).

1.1.2 Kaiser Permanente

Today, KP is the largest integrated healthcare delivery system in the US, providing health insurance and healthcare to more than 11.3 million people. Headquartered in Oakland, CA, it owns and operates 40 hospitals and 651 clinics, and includes approximately 20,000 physicians, 52,000 nurses, and 201,000 employees. Its 2016 operating revenue was $64.6 billion (£47.5 billion) (KP n.d.).

KP, along with Intermountain Healthcare, Mayo Clinic, and the Veterans Administration, is regarded as more able to make progress in innovative approaches to healthcare in the US because of their integrated operations and supporting technology platform (Bohmer 2010). A variety of participants from areas across KP's workforce serve as active participants in this research, particularly in the study of those inexperienced in innovation and design in Chapter 4 and the longitudinal study of novice learners and their experiences in Chapter 6.

The HCD approach to innovation within KP grew from the efforts of one particular department. This department, the Innovation Consultancy, began in 2003 through a partnership with IDEO, an innovation consulting firm (McCreary 2010). KP's history in design and innovation is well documented (Berwick, Nolan, and Whittington 2008; Brown 2009; Carlgren 2013b; Carlgren, Elmquist, and Rauth 2016a; Leavy 2012; Lin et al. 2011; Mager and Sung 2011; McCreary 2010; Neuwirth et al. 2012; Nussbaum 2004; Tischler 2009; Zuber, Alterescu, and Chow 2005) and provides a strong

backdrop for learning along with the other healthcare and non-healthcare organisations included in this research.

1.1.3 Addressing the healthcare innovation challenge

Developing the capability for a multidisciplinary workforce to lead innovation and change has been seen as a critical need across organisational settings (Beckman and Barry 2007; Carlgren, Elmquist, and Rauth, 2014; Martin 2009; Seidel and Fixson 2013; Roberts et al. 2016), going so far as to call the HCD approach a key element in "the most powerful formula for competitive advantage in the twenty-first century" (Martin 2010: 41). Therefore, HCD, as an approach to innovation, was selected as the focus of this research and as a viable solution to enable the transformative changes needed in healthcare.

Organisational employees from a range of disciplines learning and applying design were studied within the context of their organisational roles. The majority of the individuals in this research were not categorised as classically trained designers. They did not attend school and receive a degree in a design field, nor did they have prior job roles where they were paid for their design talent. They were learning to think like designers, which in this context meant they were learning tools and methods of HCD to help them to empathise with and understand other clinicians and their patients better, reframe problems they were facing, and think creatively to generate and rapidly test out their ideas. The research participants' backgrounds were in accounting, nursing, business, and other fields which historically have been more aligned with analytic thinking and approaches (Brown 2008, 2009). For the longitudinal study of the Innovation Catalyst programme in particular, the new learners had roles within their respective healthcare organisations to help improve the quality, service, and safety of existing patient experiences. Sometimes, they were being asked to create entirely new offerings all together.

1.1.4 Application of HCD to address the needs of patients

The primary focus of this thesis is on the application of HCD in healthcare, and KP served as the context for two of the three studies. Those within healthcare were learning HCD methods to surface patients' needs as well as methods to include patients as "co-designers" in the process overall. The role of patients, therefore, is often that of the human being designed for, using HCD methods. Patients' needs are studied by HCD practitioners and learners and are often included in the idea generation and testing phases of the work through co-design workshops. In this introductory

chapter, an example of how HCD has been applied within KP is included. This quotation from IDEO's (2005) *Field Guide to Human Centered Design* provides a description of the HCD philosophy and the role of the people being served, who are often patients and their families, for the healthcare examples:

> Embracing human-centred design means believing that all problems, even the seemingly intractable ones like poverty, gender equality, and clean water, are solvable. Moreover, it means believing that the people who face those problems every day are the ones who hold the key to their answer. Human-centred design offers problem solvers a chance to design with communities, to deeply understand the people they're looking to serve, to dream up scores of ideas, and to create innovative new solutions rooted in people's actual needs. (IDEO 2005: 9)

The individuals studied in this research have chosen to learn basic practices of HCD to help them in their healthcare roles. The Innovation Catalyst programme stated it well on their website:

> Catalysts become change agents to discover and test new ways of addressing complex challenges, partnering with colleagues across internal hierarchy and collaborating across sectors. ... They will learn how to test new ways of delivering care by applying human-centered design to a strategic challenge. (Center for Care Innovations n.d.)

A case example of a nurse leader's use of HCD is described to illuminate how the approach is utilised by multidisciplinary teams to address healthcare challenges. The process of learning HCD and its application and impact is demonstrated through three sections: learning HCD, the application of HCD, and a learner's reflection.

1.1.4.1 Case example: Learning HCD

At Kaiser Permanente, a nurse leader decided to learn HCD to approach her quality and patient experience work within the hospital in which she was employed. She began to lead her hospital's quality improvement efforts nine years earlier and had a team of people that she led in that role. In Figure 1.1 she is shown leading a design session debrief.

Figure 1.1: Dawn leading a meeting with her fellow hospital team members.

Dawn decided to learn more about human-centred design to help her with the challenges that her team was being asked to address. She felt that the traditional quality improvement methods she had utilised were best suited to challenges that had a known solution and could be measured and tracked from the beginning. When Dawn entered the Innovation Catalyst programme, she and two of her team members were focusing on how to reimagine the pregnant mother's experience to address the dissatisfaction they were facing. Their hospital had already made a number of improvements to their service offering. Despite their efforts, they had not made the improvements they were seeking to obtain.

When Dawn began the programme, she was seeking a way to understand the deeper and more important needs of mothers who had given birth in their hospital, and she wanted to apply HCD to this challenge. During the course of the programme, Dawn and her team spoke to new mothers about their feelings of being overwhelmed by the onslaught of information in formats that did not appeal to them, such as paper handouts and brochures. They went elsewhere for information and attempted to piece together what they needed to know and what sources of information they could trust. Dawn said, "I thought that I knew what our patients needed, that I was empathetic to their real needs. Through this programme, I've learned what it's really like to surface and listen to the needs of your patients".

1.1.4.2 Case example: Applying HCD

To do this, they put the patient surveys to the side for the time being and applied many tools they were learning in the programme to help them engage one-to-one with their patients and their families. They used tools such as journey maps and empathy maps to help surface experiences through their patients' worldviews instead of the clinical view that had historically been more pervasive. Figure 1.2 shows the preparation and gathering of new mothers for a design session.

Figure 1.2: Sharing of ideas with new mothers

Dawn and her team began to create and try out many ideas. They used new brainstorming techniques they had learned, sketched out ideas, and created some rough prototypes that they provided to their patients in workshops where they could edit and adjust the ideas together through co-design.

Some of the ideas they tried were new ways to support mothers through their "motherhood journey" that provided practical knowledge and insights when and where the mothers needed it. One of the ideas involved the process of guiding mothers through their pregnancies and into care of their new babies. To demonstrate their ideas, they sketched them out on individual cards and presented them to the mothers for feedback. Following their co-design session with the mother groups, video ideas gained support, and they created a series of videos. Both the sketched prototype ideas and the subsequent videos can been seen in Figure 1.3.

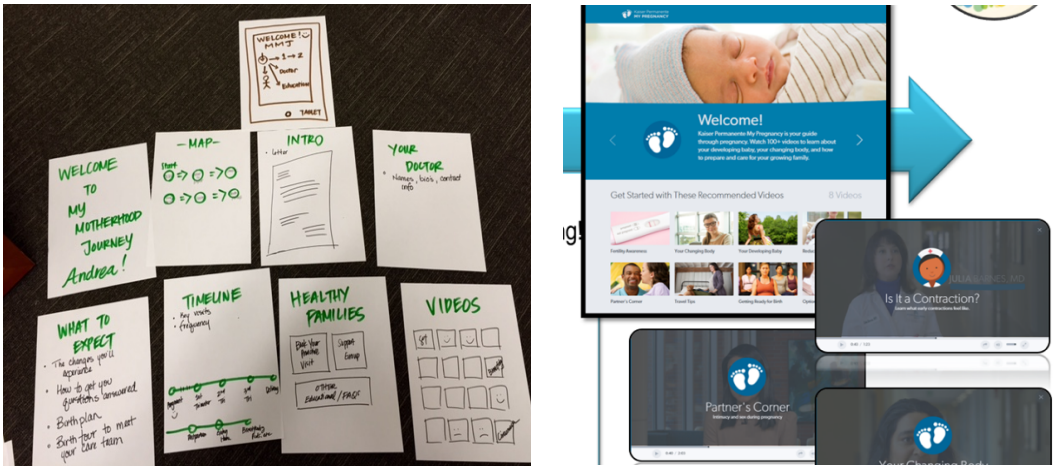


Figure 1.3: Display of low fidelity and higher fidelity prototypes

1.1.4.3 Case example: Applying HCD

Dawn and her team learned a great deal during this project, not just about mothers' needs to support breastfeeding and other aspects of their motherhood experience, but also about how to learn from and work with the patients and their family members directly to create meaningful solutions. Figure 1.4 shows a slide that Dawn and her team created for their final report about their reflections on learning and applying the HCD methods, which can be seen in yellow.

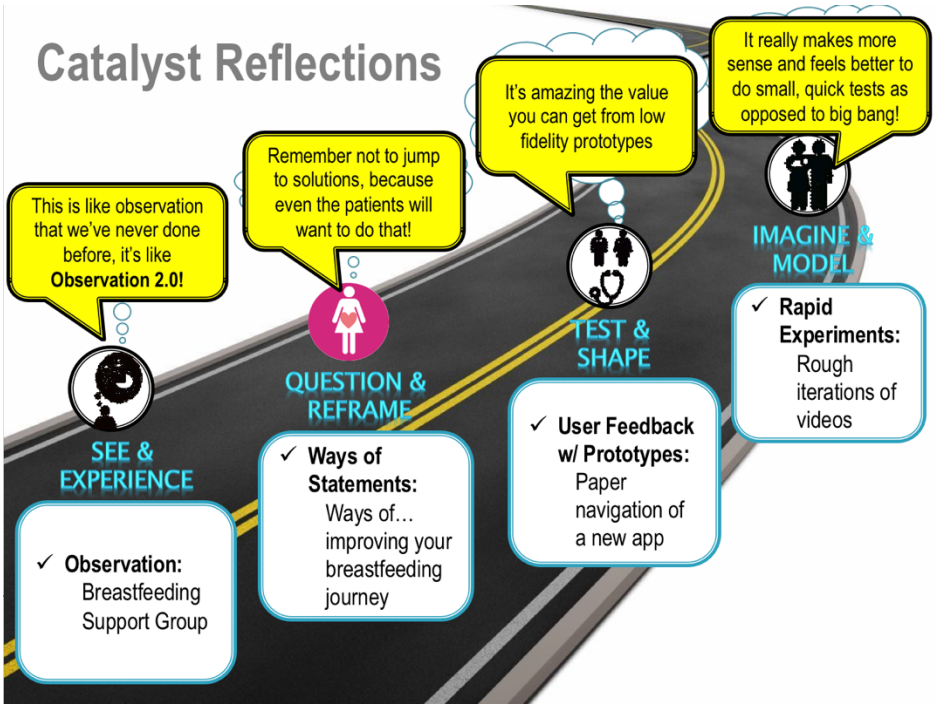


Figure 1.4: Presentation slide showing HCD project team's reflections

In this example of the application of design, the work was primarily performed by clinicians, service providers, and managers who worked within the hospital. These people, led by Dawn, were trying to provide better and safer experiences for the new mothers through learning and applying human centered design. The patients, in this case the new mothers, were included in the work to surface their needs and to provide feedback on the ideas along the way. If successful, the mothers would ultimately benefit from the design solutions created.

1.1.4.4 Additional examples of HCD application

The case example of HCD being applied to new mothers demonstrates both the experience of the new learner, in this case Dawn and her team, as well as the implication on patient care. Other participants in this research used their new and developing skills to approach questions that would impact patient care and health more broadly, such as: Would providing healthy-eating tips at a local corner market in a "food desert" help to influence healthier eating habits in the neighbourhood? Could the feeling of respect be increased in poverty-stricken patients by changing their first encounter with clinics through a new welcome and waiting room experience?

The multidisciplinary team members who utilised HCD across KP and the other healthcare organisations were broad. Table 1.1 demonstrates the diversity of team members and in the types of application and method used.

Table 1.1: Examples of how HCD has been applied in healthcare

Team	Application	Method	Output
Nurses, physicians, front office staff, IT professionals, architects	Redesign of clinic exam room	Observations Low-fidelity prototyping Simulations Live testing	Some materials have been removed from this thesis due to Third Party Copyright. The unabridged version of the thesis can be viewed
Administrators, IT professional, clinicians	Future vision of care delivery	Personas Paper prototyping Digital prototyping Journey mapping	
Quality improvement and safety managers, physicians	Care of transgender people	Semi-structured interviews Observations Co-design Culture probes	

These are examples of the experiences of the new learners and the ways in which they were applying a wide set of methods they had learned about how to better think and solve problems through the lens of human-centred design.

This research focused on the people, like those featured in the examples above, whose job it is to create and lead the changes that will help to transform healthcare in the future. The aim was to better understand their plight to use HCD to do this, which could aid other change agents in their own plights to transform the care of patients and their families across healthcare as a whole.

Establishing the case for HCD as an approach to innovation builds upon a body of empirical research on the topic (Beckman and Barry 2007; Carlgren, Elmquist, and Rauth 2014; Martin 2009; Seidel and Fixson 2013). However, lacking is how to empower the healthcare workforce with the methods and approaches to innovate using HCD. To further the line of inquiry regarding HCD as an approach to innovation within an organisational workforce, this research identified the perspectives of those who seek to learn and apply HCD, as well as those who need to lead it. With the call to action clearly established, this research aimed to create actionable approaches that

empower leaders of change across organisations through one of its most powerful resources: its workforce.

1.2 Aim and objectives of the thesis

Using a qualitative ethnographic approach (Savin-Baden and Major 2013; Hammersley and Atkinson 2007), this research sought to explore approaches that empower healthcare innovation through its workforce. More specifically, the aim was to explore and create actionable approaches for leaders to build a workforce capacity to learn and apply HCD to innovate and transform healthcare. The specific objectives were to

1. explore and review cross-disciplinary literature related to the application of HCD to support innovation in healthcare;

2. understand an untrained individual-level view of experiences leading innovation and change and identify common enablers;

3. study cross-industry HCD exemplars to gain their perspectives on the use of HCD to develop innovation capabilities within a workforce and identify common enablers;

4. explore the learner's experiences over time and map the HCD learning journey;

5. propose practice-based frameworks to empower organisational leaders to aid in the development of HCD capabilities for innovation within the workforce.

These aims were achieved through a series of studies, which are noted in Figure 1.5 with the stated research objective and resulting contribution to knowledge. The studies are then discussed briefly in Section 1.3.

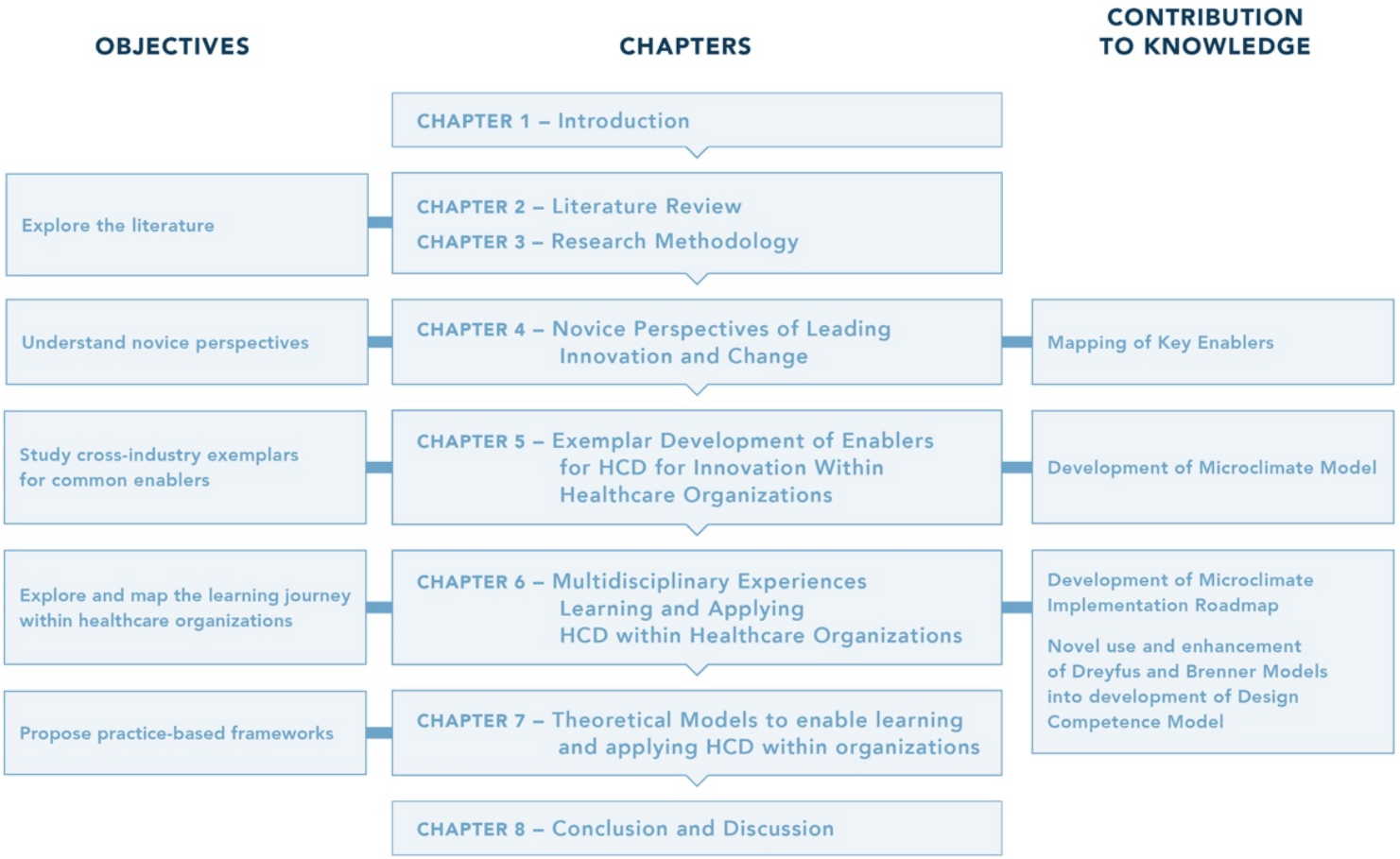


Figure 1.5: Overview of research

The objectives were achieved through a series of three studies, which are described in Chapters 4, 5, and 6, and further refined into a set of theoretical models that are captured in Chapter 7. Cumulatively, this research led to contributions to knowledge that can be actively used by organisational leaders to build a workforce capacity to innovate through HCD, which takes into account the organisational context.

1.3 Overview of the thesis

Figure 1.5 illustrates the key components of the research, and each chapter is summarised to provide an overview of the thesis. To begin, Chapter 2 presents the literature review and reviews studies related to innovation, HCD, learning design in novice multidisciplinary teams, and healthcare change and innovation as it relates to design. It suggests that innovation in healthcare is worthwhile (Bessant and Maher 2009; Christensen, Grossman, and Hwang 2009; Länsisalmi et al. 2006), yet conducting innovation in healthcare is very complex (Bohmer 2010; Cresswell, Cunningham-Burley, and Sheikh 2017; Duncan and Breslin 2009; Stringer 2000; Roberts et al. 2016) and, while identified as a critical component for success, the workforce is not naturally empowered or educated to create changes (Berwick, Nolan, and Whittington 2008; Cresswell, Cunningham-Burley, and Sheikh 2017). The use of design methods for innovation challenges has been studied and found to be a successful way to approach innovation (Beckman and Barry 2007; Seidel and Fixson 2013), but there is a lack of empirical research on how to actually build these capabilities within individuals or the wider organisation (Börjesson and Elmquist 2011; Carlgren 2013).

Having determined that design methods, or HCD, is of value for driving innovation in healthcare (Bevan et al. 2007; Coughlan, Suri, and Canales 2007; Carlgren, Elmquist, and Rauth 2014; Hillgren, Seravalli, and Emilson 2011; Lin et al. 2011; Roberts et al. 2016), it is important to explore how these approaches are learned and applied in multidisciplinary teams to build innovation capabilities in their workforce. The remainder of this thesis focuses, therefore, on exploring how to learn and apply HCD within the workforce and develop an approach for innovation within healthcare.

Chapter 3 presents the methodology adopted. The thesis seeks to illuminate the experiences and enabling conditions of the individual, ranging from novices to experts, as they attempt to learn and apply HCD methods for innovation within large organisations. Three primary studies were conducted to provide insight and perspective into this complex phenomenon at various stages of adoption. Qualitative

ethnography was used which provides a flexible approach for a practitioner actively studying within the context of their environment. Design tools were applied to gain understanding and feedback from users, thematic analysis was used to code transcribed interviews and discussions, and user feedback and reflections were employed to refine the findings into useful and actionable approaches within the users' organisational practice.

In Chapter 4, the first empirical study is outlined. The aim of this study was to understand the individual perspectives of enablers of champion innovation and change, who had not been exposed to HCD methodologies. They were asked to reflect on how they have been champions of innovation and change in a broader setting than just the workplace. Their emotions and activities associated with being a champion of innovation and change were captured and synthesised on a personal level free of organisational context. To begin, nurses were studied, as they make up the largest profession in healthcare and were identified as a group in need of abilities in innovation and change in the workplace. This study revealed a set of enablers that this participant group experienced in their efforts to champion innovation and change.

To explore the work environment more fully, the research was broadened to include both healthcare and non-healthcare industries. This provided a wider range of exemplars to study, who had successfully created a HCD practice for innovation within their workforce.

Building on Chapter 4, Chapter 5 presents the empirical study of organisational exemplars in leading innovation through HCD, referred to in the study more briefly as "change agents". The aim was to gain cross-industry themes from leaders in this field about the experiences of learning and applying HCD.

This was accomplished by studying 15 change agents using in-depth interviews and journey-mapping activities to surface novel approaches to creating a HCD entity within organisations before it is fully developed or supported by the organisational culture. These insights were synthesised into the creation of a model that demonstrates their approach to creating smaller subcultures, or climates, for innovation and design within the context of their larger organisation. The findings provide insights to compare, contrast, and further frame the other case study findings and identify areas of transferability.

In Chapter 6 the third study is presented, which looks at the learning and application journey of novices and the experts who aid their development. The programme participants, called “innovation catalysts” or “catalysts”, were HCD learners who provided real-time, in-the-wild views into the stages of development of new learners as well as their interactions and responses to organisational context. The study took place over one year and resulted in a phased model of learning to aid individuals working within organisations to proactively anticipate and monitor the skill building from novice to expert.

To achieve a comprehensive view of the phenomena of learning and applying HCD for innovation, a variety of perspectives were sought. Figure 1.6 maps all three studies from Chapters 4 to 6. Collectively, they convey a comprehensive description of the learning and application journey of novices through experts in the field of innovation and HCD. It also demonstrates the ability to compare enablers from a healthcare and non-healthcare context perspective to observe whether common patterns emerge across the dimensions, thus strengthening the findings.

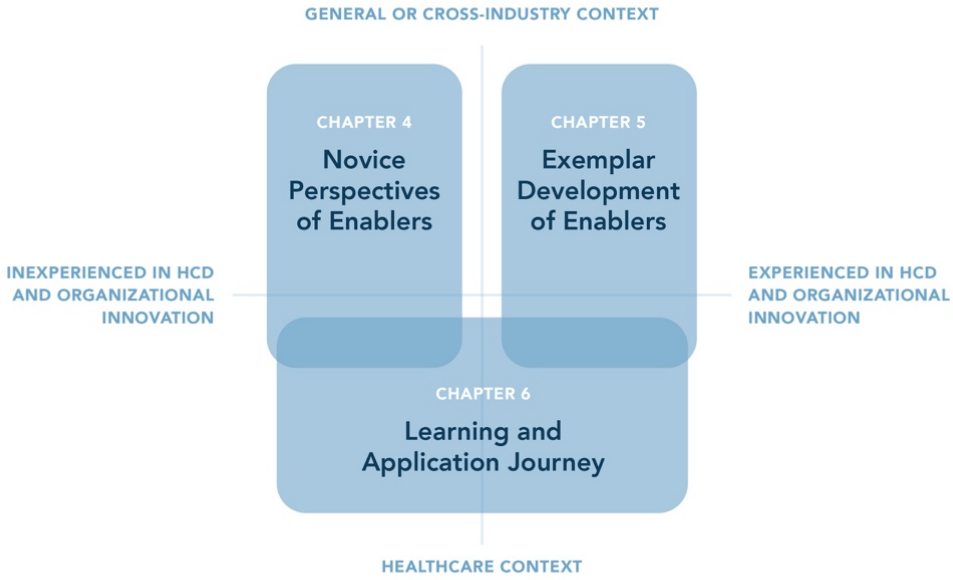


Figure 1.6: Context and experience of the three studies contained within the research

The change agent exemplars in Chapter 5 had been practising HCD in their organisations for five years or more. They had used HCD to create new technologies to help people track their finances and save money for their future, to make the unemployed individual feel more empowered and result in finding a new job more quickly. They used HCD to redesign the function and layout of ambulatory clinic offices that improve the care delivery experience for both the patients and the clinicians. However, they did not begin with these large efforts, and they did not always have the expertise they were now exhibiting. These exemplars began as new learners.

The study of novices in Chapter 4 demonstrates the needs that healthcare workers have as they reflect on how to support their innovative efforts. These individuals had not been exposed to HCD. In the study discussed in Chapter 6, learners enrolled in the Innovation Catalyst programme were studied over the course of a year as they learned and applied HCD methods. They used their new and developing skills to try out ideas and answer questions such as “Would providing healthy-eating tips at a local corner market in a ‘food desert’ help to influence healthier eating habits in the neighbourhood?” “Would creating a series of videos featuring physicians and new mothers help with knowledge gaps in new mothers more than the existing printouts and brochures they were provided with?” “Could the feeling of respect be increased in poverty-stricken patients by changing their first encounter with clinics through a new welcome and waiting room experience?” Time was spent observing and talking with patients, visually mapping out their experiences, writing and re-writing the problem the care team “thought” they were trying to solve, only to learn their patients’ views of the world were very different. These are all examples of the experiences of the new learners and they ways in which they were harnessing what they had learned about how to better think and solve problems through the lens of HCD.

The output of the literature review and the three studies are drawn together in Chapter 7, where all the theoretical models created are briefly reviewed as one body of work. In this chapter, the iterative development of the models is shown and their practical use described in more detail. They are viewed as a system of tools that function together. A set of examples is provided for potential users, along with a step-by-step approach to illustrate the application of the models for this purpose.

In Chapter 8, conclusions and future work are discussed. A comparison is made of learners at all stages to identify and discuss the common enablers for HCD for innovation, and the models and framework conclude the novel output of this research.

These contributions address healthcare's lack of innovation infrastructure and risk adversity, with unique approaches to the creation of international microclimates. The lack of a workforce capacity to innovate is challenged by taking this microclimate approach and creating a new learning model to assess and further develop learners' abilities to progress in HCD. Future work for this research is presented, which focuses on further testing of the models and framework with users over time to better understand changes needed or additional development that may make them more impactful and useful.

1.4 Contributions to knowledge

The central premise of this research is that while innovating within healthcare is hard, people who want to lead innovation through HCD can be empowered to develop workforce practices to do just this. Exploration of this idea through studies of individuals ranging from new learners to exemplars in the field has resulted in the following original contributions:

1. Identification and mapping of key supportive conditions and behaviours for individuals to successfully apply HCD for innovation;

2. A theoretical microclimate model, which defines the necessary components for successful application of HCD methods for innovation in large organisations;

3. An implementation roadmap for the microclimate model to provide a practical path for leaders of change to develop their own microclimate for innovation within the workforce;

4. A new design competency model that proposes stages of learning HCD methods for innovation by multidisciplinary teams and achieved through novel application and enhancement of the Dreyfus skill-building model and the Benner nursing competence model.

Chapter 2: Literature review

In Chapter 1, the challenge of individuals learning and applying HCD for innovation within organisations was identified. This chapter reviews related literature from the fields of design, healthcare, innovation, and learning. The review covers studies that have highlighted the need for innovation in healthcare and current approaches and challenges to achieving innovation in the healthcare setting. The focus of this thesis is on both the individual who is trying to innovate and the experience of that person as a learner and an agent of change within their organisation; therefore, the review considers literature in the area of learning.

2.1 Defining terms

This thesis focuses on HCD as an approach for individuals to contribute to organisational innovation. The working definition of HCD will be of a collaborative and iterative user-centred design (UCD) methodology for use by multidisciplinary teams (Seidel and Fixson 2013). The expanded view of it aligns with that of Thomas Lockwood, former president of the Design Management Institute (DMI), who provided a definition of design as a process and a mindset. It encompasses both HCD and its approach as a process for innovation; that is, "a human-centered innovation process that emphasizes observation, collaboration, fast learning, visualization of ideas, rapid concept prototyping, and concurrent business analysis, which ultimately influences innovation and business strategy … a methodology for innovation and enablement" (Lockwood 2010: 6).

It is notable that the terms human-centred design, user-centred design, and design thinking (DT) are often used interchangeably (Norman and Verganti 2012). For this study, the literature of both HCD and DT was heavily relied upon, as it aligns with the methods and mindsets being taught to novice multidisciplinary teams at KP, the primary case study, as well as the other organisations included in the research overall (Carlgren, Elmquist, and Rauth 2014). Each of these methods has a common framework, described as an iterative cycle consisting of observations, idea generation, and rapid prototyping and testing (Moody, Long, and McCarthy 2014; Norman and Verganti 2012).

In summary, the term HCD is used throughout this research. This acknowledges the common vernacular used by the organisations that were a part of the study and of the primary case study focus, KP, as well as the term's broader acceptance in the

healthcare service literature, which includes additional healthcare organisations such as the National Health Service (NHS) and Mayo Clinic (Bessant and Maher 2009; Bevan et al. 2007; Duncan and Breslin 2009; Lin et al. 2011).

2.1.2 Innovation

Innovation is a central theme in this thesis. Healthcare literature (Bessant and Maher 2009; Bevan et al. 2007; Lin et al. 2001) has evolved in attempts to clarify the difference between innovation and improvement, and both are still acknowledged as approaches to positive change within organisational settings (Bessant and Maher 2009; Bevan et al. 2007).

Improvement makes incremental changes to reach a new level of system performance. It has been argued that improvement methods, such as Lean and Six Sigma (Lin et al. 2011), do not provide the level of change that is needed for innovation, nor do they work as effective approaches if the organisational context shifts. With a shifting context comes the need for approaches that support innovation and provide tools for more radical changes in the system (Berwick 2003; Mate 2014). The Institute for Healthcare Improvement, an international body dedicated to bettering health and healthcare, defines improvement as “the act of raising something to a more desirable or more excellent quality or condition” (Wetherhold 2012: 1) and innovation as “the act of making changes in something established by introducing new methods, ideas or products” (Wetherhold 2012: 1). This helps to differentiate between innovation and improvement, primarily that innovation introduces the new as opposed to improving upon the known.

The definition that was selected for innovation combines both the aspect of introducing new ideas as well as the recipients of the change itself; that is, “the intentional introduction and application of new ideas, processes, products or procedures designed to significantly benefit the individual, the team, the organisation, or wider society” (West and Wallace 1991: 303). With innovation as a central premise, we now shift to how it presents itself in the healthcare setting.

2.2 Innovation in healthcare

The rising cost of healthcare is putting existing systems around the world under pressure to change; therefore, knowledge, skills, and organisational structures are continually in need of upgrading (Organisation for Economic Co-operation and Development [OECD] 2006). Based on a review of literature published about

innovation in healthcare, the research focus has typically been on new services, new ways of working, new technologies, or a combination of the three (Länsisalmi 2006). Still, very little innovation has been found within the organisation of the healthcare system itself (Länsisalmi 2006). The services, ways of working, and technology innovations have tended to be in the areas of coordinating care between the hospital and the home environment and the alignment of incentives between those who pay for the care and those who provide the care. In the US, an additional challenge exists in providing the needed goods and services that proactively address the health and healthcare needs of people that deal with the social and environmental factors contributing to poor health (Cutler 2011). The healthcare system in the US has a unique set of circumstances that surround the need and approach to innovation.

2.2.1 The need for innovation in healthcare in the United States

Healthcare in the US has many of the same challenges as found in other countries, including the need to reduce costs and increase access to services (OECD 2006) and to do this within a system that is highly regulated and often seen as resistant to change (Christensen, Grossman, and Hwang 2009).

The Institute of Medicine (IoM), a US-based organisation that is a part of the US-based National Academies of Sciences, Engineering, and Medicine, published what is considered a seminal report in healthcare (IoM 2001). The report, *Crossing the Quality Chasm*, reviewed the quality of the healthcare system in the US. It revealed large gaps and deficiencies between the care that people receive and the care that they should receive, and that this occurs in all healthcare settings, in all age groups, across the country. The report cites a key factor as being the rise of chronic conditions, some attributed to the ageing population, and the “silos” that have developed across healthcare delivery to provide a deep focus on these complex patient health conditions instead of viewing the patient’s chronic and complex conditions as a whole system. It has been noted that these often-separate care settings and specialised but independent practitioners lead to uncoordinated care. In some cases, this uncoordinated care has led to patient harm due to the multiple handoffs among care givers, the lack of complete patient health information, and communication breakdowns between caregivers and patients (IoM 2001).

Coordination of existing medical specialties is seen as a key need for innovation, but an opposing view is that the overabundance of subspecialties is a major problem, as the incentivisation of these providers leads to the provision of more care and more cost

than are necessary. Supporters of this philosophy believe that an entirely new business model is needed and less expensive professionals, working in a less expensive care setting, to remove costs from the healthcare system itself (Christensen, Grossman, and Hwang 2009).

While the root causes of the problems may vary, experts agree that the approach requires substantial change and innovation in multiple facets of healthcare (Berwick 2003; Christensen, Grossman, and Hwang 2009; IoM 2001; OECD 2006).

2.2.2 Challenges of innovation within healthcare

How innovation is approached and what is viewed as innovation in healthcare varies. Within healthcare organisations, innovations are typically framed as new ways of working or new technologies (Länsisalmi 2006), although the literature on healthcare innovation is limited (Weberg 2013). Overall attitudes about innovation in healthcare are positive as it is viewed as worthwhile and productive (Länsisalmi 2006), but the level of complexity and difficulty in conducting innovation in healthcare is high (Burns 2012). Based on the most prevalent themes in the literature, three challenging areas for healthcare are highlighted: culture, infrastructure, and capabilities.

2.2.2.1 Culture and aversion to risk

Most agree that “healthcare innovation should be a strategic imperative at national level” (Cresswell, Cunningham-Burley, and Sheikh 2017: 777) but healthcare organisations are risk averse and demonstrate a lack of time or financial investment in innovation-related activities. The importance of empowering patients and promoting learning and innovation is also noted, but little is known about the source of an innovation or the processes by which to create the innovations (Keown et al. 2014). Thus, there is a paradox between the importance of innovation in healthcare and the low level of understanding and investment in implementing it.

As context for the challenges of leading change within organisations, it has been said that “most large firms are poorly equipped to implement a growth strategy based on radical innovation, because most large firms are genetically programmed to preserve the status-quo” (Stringer 2000: 2). The challenges of innovating in healthcare specifically have been blamed on funding and risk aversion by some (Cresswell, Cunningham-Burley, and Sheikh 2017) and a lack of innovative practices, culture, and structure by others (Chin et al. 2012). One such structure in healthcare is the process for creation of new knowledge through the clinical trial process.

2.2.2.2 Infrastructure of healthcare

It has been suggested that the challenges in healthcare innovation are because of the complexity of healthcare organisations and medical practices (Shortell et al. 2001) and the difficulty in changing the behaviour of clinicians (Greco and Eisenberg 1993). Another view is that the challenges are due to two "frozen" business models: of the general hospital and of the physician practice (Christensen, Grossman, and Hwang 2009).

For innovation to occur at a faster pace, a different approach is needed to the controlled trial approach, which has historically been the "gold standard" in medical care (Chari 2012). The average length of the clinical trial process is 6 to 11 years (DiMasi, Grabowski, and Hansen 2015), whereas innovation as discussed in the literature relies on rapid experimentation and testing that occurs in a matter of hours or days (Liedtka, King, and Bennett 2013). Clearly, not every innovation is a new drug development that requires a clinical trial process, but that expectation and practice of innovation in healthcare has created a mindset that innovation only occurs in very formalised and regulated structures over long periods of time (Chari 2012). This sentiment has been echoed by other experts in healthcare innovation, including the IoM (IoM 2001; Olsen, Aisner, and McGinnis 2007).

2.2.2.3 Capabilities to innovate

Healthcare thought leaders have stated over a number of years that healthcare workers need to develop competency for innovation (Berwick 2003; Berwick, Nolan, and Whittington 2008; Roberts et al. 2016). How this can be achieved is intertwined with how organisations at large create capabilities for innovation. To support individual competency, organisations need the capabilities to innovate to support the individual ability to act (Ulrich and Smallwood 2004). However, little has been written about how innovation capabilities can be built and developed in practice (Carlgren, Elmquist, and Rauth 2014; Schreyögg and Kliesch-Eberl 2007; Roberts et al. 2016), barring a few exceptions (Börjesson, Elmquist, and Hooge 2014; Carlgren, Elmquist, and Rauth 2014; Ellonen, Jantunen, and Kuivalainen 2011). Capabilities focused on innovation are intended to drive organisational change (Ellonen, Jantunen, and Kuivalainen 2011), but in healthcare, many challenges are faced when it comes to the capabilities to innovate. With high levels of industry regulation and an expertise-based workforce across multidisciplinary teams, the workforce is not naturally empowered to create change (Berwick, Nolan, and Whittington 2008; Roberts et al. 2016). To innovate,

organisations, including those in healthcare, need to have the right culture, leadership practices, personnel, and structure (Chin et al. 2012).

How to develop approaches to innovation are of interest and importance in healthcare (Cresswell, Cunningham-Burley, and Sheikh 2017). Historically, healthcare has taken on the challenges of identifying, sharing, and implementing best practices through improvement methodologies (Berwick 2008; Roberts et al. 2016). More recently, leading healthcare organisations have begun to turn towards methodologies that support more radical innovations and have been actively seeking approaches to build this capability within their workforce (Berwick 2003; Bessant and Maher 2009; Bohmer 2010; Lin et al. 2011; McCreary 2010; Roberts et al. 2016).

2.2.3 Approaches to achieving innovation in healthcare

Healthcare is inherently risk averse (Cresswell, Cunningham-Burley, and Sheikh 2017) and has a complex infrastructure that resists change (Chin et al. 2012; Christensen, Grossman, and Hwang 2009). Risk, or mindset barriers and infrastructure barriers, are stated as “typical” barriers to innovation along with the lack of skills and motivation for innovation (Assink 2006). Healthcare, and healthcare service delivery in particular, is seen as lacking in organisational skills and capabilities to innovate more than most other industries such as technology, telecommunications, automotive, food, and aerospace (Bohmer 2010).

Integrating innovation in healthcare organisations can be viewed as a social process, in which many players are involved. It is often focused on the development of new products, services, and processes for quality improvement and cost reduction (Weberg 2013). Healthcare technology is frequently cited as an area of strength for the US in particular (Cresswell, Cunningham-Burley, and Sheikh 2017). However, the area of strength needed is an approach to creating innovation through organisational capabilities and innovation competency, according to many industry experts in innovation, design, and healthcare (Berwick 2003; Bohmer 2010; Coughlan, Suri, and Canales. 2007). KP, one of the primary case studies in this work, has been featured in business journals as a progressive healthcare leader in its evolving application of HCD for innovation within its workforce (Brown 2009; McCreary 2010). The need to develop an innovation practice and approach leads to a further discussion about approaches to building innovation capabilities.

2.3 Building innovation capabilities

Organisational capabilities reflect an ability to deploy the resources the organisation has available towards an area of need (Ulrich and Smallwood 2004). Innovation management has been viewed as an organisational capability that can be applied towards a problem or area of need (Christensen, Bohmer, and Kenagy 2000; O'Connor 2008). The main barriers to the development of innovation capabilities, or the so-called "muscles for innovation" (Börjesson and Elmquist 2011: 174) are perceived to be the norms and values within an organisation that do not support creating innovations or building innovation capabilities (Börjesson and Elmquist 2011), as well as the organisational processes or methods in place (Carlgren, Elmquist, and Rauth 2014; Christensen, Bohmer, and Kenagy 2000).

Building innovation capabilities occurs over time through a process of learning by doing (Ellonen, Jantunen, and Kuivalainen 2011), or stated a different way, innovation capabilities develop because of the development of an overall learning process within an organisation (Börjesson and Elmquist 2011; Schreyögg and Kliesch-Eberl 2007). As such, creating capabilities for innovation could be guided by an understood and repeatable process and a culture that supports it (Börjesson and Elmquist 2011; Lawson and Samson 2001; O'Connor 2008). The challenge lies in the traditional view that the processes and culture need to be present across an organisation's entire system to develop innovation capabilities (O'Connor 2008).

Beyond the innovation itself, the source of an innovation, or more simply stated, how to create innovations (Keown et al. 2014) is of interest and importance. Still, despite the growing interest in capabilities for innovation, there is a lack of empirical research on how to build them within individuals or the wider organisation (Börjesson, Elmquist, and Hooge 2014; Carlgren 2013a).

2.3.1 From organisational capabilities to individual competency

The organisational capability perspective requires a systems view of enabling innovation, yet it is argued that a systems view does not take into account the parts that comprise the whole system (Felin and Foss 2009). Felin and Foss (2009: 166) argued that "to fully explicate organizational routines and capabilities … one must fundamentally begin with and understand the individuals that compose the whole".

Capabilities and competency are often confused and viewed interchangeably, but an attempt to distinguish between the two has been provided (Ulrich and Smallwood

2004). If an individual's ability to practice design were seen as a technical ability, it would be considered an individual competency. Organisational capabilities, on the other hand, can "emerge when an organisation delivers on the combined competencies and abilities of individuals" (Ulrich and Smallwood 2004: 121). In summary, for an organisation to be innovative, it requires the workforce to have the individual competency for innovation, and the organisation itself needs to have the capabilities to support it and make it real.

2.3.2 Individual innovation competency in healthcare

Although there is an established importance for individual competency in innovation, the majority of healthcare innovation studies have focused on the adoption of innovation (Länsisalmi 2006). Environments that support individual competency in innovation in the current literature more broadly include shared and clear objectives (Amabile and Pratt 2016; Länsisalmi 2006), psychological safety (Amabile and Pratt 2016; Edmondson and Lei 2014; Tucker and Edmondson 2003), and the ability of employees to participate (Länsisalmi 2006), all of which are added to sufficient resources and training to do the work (Amabile and Pratt 2016; IoM 2001).

An additional perspective on approaches to creating change in healthcare through the workforce comes from a Forum on Healthcare Innovation hosted by Harvard Business School and Harvard School of Medicine in 2012. The forum yielded five key imperatives for healthcare innovation, one of which was the need for an approach to promote novel approaches to process improvement. Of note is the creation of an environment that acknowledges "failure" and experimentation for learning. This requires an individual skill and competency in rapid experimentation (Chin et al. 2012) along with an environment of psychological safety (Edmondson and Lei 2014), or the shared belief that the environment is safe for interpersonal risk taking, without fear of negative consequences.

There are some notable exceptions in the literature where innovative practices and behaviours are highlighted. These practices include areas such as innovation leadership (Weberg 2014), reflective practices (Länsisalmi 2006; Schön 1983), skills in HCD through in-the-wild studies and practitioner reflections (Bevan et al. 2007; Coughlan, Suri, and Canales 2007; Lin et al. 2011; McCreary 2010), and the motivation of employees to innovate (Amabile and Pratt 2016; Länsisalmi 2006).

Pulling these studies together leads to an argument that innovation can be created in healthcare when there is a workforce that has a capacity for creativity and innovation, an environment that is viewed as psychologically safe, and contains the needed resources, infrastructures, and support to conduct the innovation activities (Chin et al. 2012). It would reason, then, that the individuals attempting to create innovative solutions within healthcare settings need to create environments that align with these conditions, but how to do that is unclear. Insights from those who have successfully tackled change within complex environments could serve as an enabler of innovation, first for the individuals leading it and for the organisations who are trying to build capabilities for it (Carlgren 2013a, 2013b). This brings us back to the aim of this research, which was to explore and create actionable approaches for people looking to lead innovative changes in healthcare using HCD within organisations.

2.4 Human-centred design as an approach to innovation

Thinking and approaching complex challenges in a "designerly" way has been discussed in literature (Cross 2001, 2007) as an approach to creating a design discipline which is enhanced through reflective practice (Schön 1983; Seidel and Fixson 2013). Throughout the 1990s, research focusing on the use of design by non-designers became more prominent, with a focus on aiding an understanding of the practice of HCD (Cross 2001, 2007).

The value of HCD has been found to apply to innovation as well as to strategy, new product design, and organisational development (OD) (Brown 2009; Carlgren, Elmquist, and Rauth 2014; Holloway 2009; Liedtka and Ogilvie 2011). While this application is broad, the agreement around the primary HCD approach is considered consistent and emphasises the identification of people's needs, brainstorming ideas, and prototyping (Brown 2009; Seidel and Fixson 2013).

In the early 2000s, HCD as a management concept was developed and popularised by the design firm IDEO (Brown 2009) and educators like Stanford University's "d.school" and Darden School at the University of Virginia (Carlgren 2013a; Liedtka and Ogilvie 2011). It also gained in popularity with management scholars who had worked with or studied the work of designers (Blomkvist 2010; Hargadon and Sutton 1997; Jahnke 2013; Martin 2009) and popular press outlets (Brown 2009; McCreary 2010). The scholarly effort was placed on better understanding professional designers and attempting to translate what they did and how they did it to the world of business.

While HCD has been well studied by design firms and professionally trained designers over the past three decades (Hargadon and Sutton 1997), less is known about others who are attempting to use design in their workplace, who are not professionally trained (Seidel and Fixson 2013). Recent management discourse describes HCD as ultimately inspired by the way that designers think and work, which can be utilised by non-designers (Brown 2008; Carlgren 2013a; Johansson-Sköldberg, Woodilla, and Çetinkaya 2013; Kimbell 2001; Seidel and Fixson 2013) and has led to firms touting its value for businesses. The research on non-professionally trained designers or novice multidisciplinary teams is more recent in the literature (Seidel and Fixson 2013), and studies within organisational settings are emergent in HCD research (Carlgren 2013a; Carlgren, Elmquist, and Rauth 2016a; Liedtka and Ogilvie 2011).

The Design Council in the UK argued that HCD plays a key role in innovation (Design Council 2009; Whicher, Raulik-Murphy, and Cawood 2011), but others have been more sceptical of its ability to be practised by non-designers (Verganti 2008) and dismiss it as a fad due to a lack of theoretical foundation (Jahnke 2013). Still, design and an organisation's capabilities to practice it have been positioned as a valuable approach to address service and innovation needs (Brown and Wyatt 2010; Berkowitz and McCarthy 2012; Dunne and Martin 2006; Lockwood 2010).

In business management discourse, the use of design methods for innovation challenges has been studied and found to be successful (Beckman and Barry 2007; Verganti 2008), and many large organisations such as KP, IBM, Proctor and Gamble, SAP, and the NHS have made significant efforts to build organisational capability and individual capacity for HCD and innovation (Carlgren 2013a; Lafley and Charan 2008; Martin 2011; McCreary 2010). True to how HCD has been conveyed (Brown 2009; Lockwood 2010), the focus has been on people who are not professionally trained designers (Cresswell, Cunningham-Burley, and Sheikh 2017; Holloway 2009; Martin 2011; McCreary 2010), also referred to as "novice multidisciplinary teams" (Seidel and Fixson 2013: 2).

Some studies argue that HCD is more appropriate to incremental innovations (Norman and Verganti 2012). Controversies exist over whether or not HCD is applicable for more radical innovations where the change may need to come from technology or new meanings altogether (Norman and Verganti 2012). This discourse is not agreed upon by all researchers in the field, some of whom find it suited to innovation as it deals with complex matters and ambiguity (Beckman and Barry 2007; Brown 2009; Bruce and

Bessant 2002). Others find more importance in differentiating it from the most common approach to invention and innovation in healthcare; that is, the scientific method, predominantly pertaining to new drugs and devices. A key differentiator, HCD has been described as a method that focuses on “what might be” rather than the focus of “what is” in the scientific method (Liedtka and Ogilvie 2011; Roberts et al. 2016).

Regardless of HCD’s ability to drive incremental or radical innovation, it has been looked to as a novel and important approach for organisations to drive innovation. Additionally, the value to individuals seeking new approaches to develop the capacity to innovate is growing (Martin 2009; Liedtka and Ogilvie 2011; Roberts et al. 2016) and is therefore important as a focus for research.

2.5 Human-centred design in healthcare

HCD methods are a way for healthcare services to actively engage with patients (Bessant and Maher 2009), and HCD is potentially a more effective approach for engagement in healthcare than the widely accepted improvement methodology (Bevan et al. 2007; Roberts et al. 2016). Still, wide adaptation of such methods in service sectors, such as healthcare, is less clear and therefore less studied than in many other industries (Bessant and Maher 2009; Lin et al. 2011; Roberts et al. 2016). Empirical data from the NHS as a case study demonstrates how design may expand thinking around organisational theory and practice. It is believed to offer organisations new methods, approaches, and processes around large-scale change (Bessant and Maher 2009).

Stages of “thinking like a designer” were created for the 10 High Impact Changes initiative, which included well-cited activities in design such as reflection (Seidel and Fixson 2013; Schön 1983), visualisation, and prototyping (Bevan et al. 2007; Liedtka and Ogilvie 2011). Overall, the approach to using HCD to create high impact changes, or innovations, was found to be good, but implementation of design solutions was varied across the NHS system with many being ineffective, thus stating that HCD as an approach has value in creating innovations, but it remained unclear how to best implement the innovations within the healthcare system (Bevan et al. 2007; Lin et al. 2011; Roberts et al. 2016).

Building upon this gap in knowledge, Lin et al. (2011) applied HCD methods to the implementation of a large-scale change initiative at KP by merging change management principles with HCD (Börjesson, Elmquist, and Hooge 2014; Schreyögg

and Kliesch-Eberl 2007). It was acknowledged that at the time of the NHS study, HCD as an OD intervention was “still in its infancy” (Bevan et al. 2007: 15), but there was still promise in the concepts. Four years later, the continued lack of research in the area was noted (Lin et al. 2011), but researchers and consultants at KP echoed the same optimism as Bevan et al. (2007) and demonstrated the ability for nurses, physicians, and other healthcare providers to engage with design to create innovative solutions and the organisational will to implement them (Coughlan, Suri, and Canales 2007; Lin et al. 2011).

Much research surrounding design and healthcare has focused more on design for OD (Brown and Martin 2015; Coughlan, Suri, and Canales 2007; Lin et al. 2011). Studies have demonstrated the value of specific design approaches for prototyping and testing solutions in live environments with users to enable collaborative learning and collaboration in healthcare (Coughlan, Suri, and Canales 2007; Hillgren, Seravalli, and Emilson 2011). This type of learning by doing is viewed as a core organisational approach to building design capabilities (Chua, Leong, and Lim 2010).

Interestingly, the testing of more complete solutions in a live clinical environment has been identified as the area in which the NHS fell short of fully optimising their own 10 High Impact Changes initiative (Bevan et al. 2007). The organisation prototyped and tested segments of their solutions early on but failed to prototype the complete solution set, which was believed to have a negative effect on implementation (Bevan et al. 2007). Cooperrider and Godwin (2011) noted this prototype and field-testing activity for OD benefits, as well. They believed that design firms, like IDEO, were expanding into “organisational transformation”, using HCD as an approach to create acceptance of innovations internally (Cooperrider and Godwin 2011). It was believed that design at this stage was becoming the “go to” for not just the design of services and products, but for OD (Cooperrider and Godwin 2011; Coughlan, Suri, and Canales 2007).

Carlgren (2013b) through her PhD research studied the concept of HCD and the building of innovation capabilities in organisational settings, using KP as a case study. She argued HCD could play a role in building innovation capabilities. She found that organisations vary in their perceived value of the HCD approach, and that they recognise value in the approach, ranging from resources, processes, mindset, and strategic intent to innovation. She found that the long-term use of HCD aids in building innovation capabilities.

Additionally, her study revealed that design methods are used not only in the early discovery stages of innovation, but also in later phases when innovations are further developing and potentially spreading more broadly (Carlgren 2013b). This is equivalent to the application of design for OD work, as identified by design practitioners (Brown and Martin 2015; Coughlan, Suri, and Canales 2007; Lin et al. 2011). The merging of design methods, and "visualisation" of ideas in particular, with other methods to aid in the later implementation stages of innovation have been noted (Brown and Martin 2015; Coughlan, Suri, and Canales 2007; Lin et al. 2011). This furthers the case for the evolution of design in healthcare and other organisations from early-stage idea development to change management and OD. It also demonstrates how HCD can influence and be influenced by the context of the organisation. However, as discussed in Section 2.4, it falls short of explaining how individuals can learn HCD and how enablers can support application of HCD within the context of organisations.

2.6 Novice multidisciplinary teams learning and applying HCD in organisations

The focus of this research was the learning and application of HCD by employees who are not trained as designers but may be undertaking design or innovation activities within their role. Having determined that HCD is likely to be of value for driving innovation in healthcare (Bevan et al. 2007; Coughlan, Suri, and Canales 2007; Hillgren, Seravalli, and Emilson 2011; Lin et al. 2011; Roberts et al. 2016), it is important to explore how these approaches are learned and applied in multidisciplinary teams by non-designers. Multidisciplinary teams, comprising doctors, nurses, therapists, and administrators, are predominant in the workforce of healthcare organisations. This understanding provides a better ability for healthcare, as well as other industries, to build individual capacity, ultimately leading to organisational capability and individual capacity in design for innovation (Carlgren 2013b; Seidel and Fixson 2013).

The role of experience in learning has been heavily studied (Beckman and Barry 2007; Dewey 1938; Kolb 1984) and has been emphasised as a critical element in learning HCD (Beckman and Barry 2007). Dewey (1938) proposed that learning occurs as new experiences are compared and contrasted with old experiences to continuously learn and adapt. This back-and-forth comparison demonstrates that to learn, a learner needs to continuously gain hands-on experience to develop the required abilities. This iterative style of learning is particularly suited for the rapid experimentation approach found in HCD (Beckman and Barry 2007).

Kolb (1984) used four steps to create his “experiential learning theory”: experiencing, reflecting, thinking, and acting. Of note in Kolb’s theory is the act of reflection, also found to be critical to effective novice teams learning HCD (Seidel and Fixson 2013). Reflective practices were also found to be a positive differentiator for the teams who practised reflection, particularly in the early phases of ideation and prototyping (Seidel and Fixson 2013).

These approaches show the iterative nature of learning and the active process by which it occurs, and presumably, the learner becomes better skilled over time because of the comparative experiences (Beckman and Barry 2007; Dewey 1938; Kolb 1984). This demonstrates that a few key models from outside the design field capture relevant elements of “learning by doing” and the reflective aspect seen in design (Ellonen, Jantunen, and Kuivalainen 2011). Literature in HCD has discussed the phases of design with relative clarity and consistency (Brown 2008; Liedtka and Ogilvie 2011), but there is a lack of research exploring how these skills and approaches are learned in novice multidisciplinary teams of non-designers (Seidel and Fixson 2013).

2.6.1 Models of learning HCD in novice multidisciplinary teams

Kelley and Kelley (2012) took a different angle to learning and turned towards the social psychology literature of Bandura (1989) to enhance the understanding of the HCD learner. They referred to self-efficacy in their work to show how practising HCD methods can help lead to an increase of creative confidence (Kelley and Kelley 2012). This self-efficacy focuses on a person’s belief about their capacity to control events that affect their lives, or in this case, that affect their learning of HCD (Kelley and Kelley 2012).

While useful at demonstrating how learning occurs, this approach does not clarify stages of learning or development for individual learners, but rather, it develops an important psychological component that needs to be in place to develop as a confident practitioner of HCD. To understand what would support individual growth and development in an organisational setting, more understanding of the practice in context is needed.

Charles Owen (1998) attempted to account for where learning takes place in his model to demonstrate the building and using of knowledge in design. He postulated that design knowledge can be divided into two main “realms”: the theoretical and the practical. The theoretical realm is the space of discovery where new learnings or

knowledge is created. The practical realm is the place where the actual invention or "making" occurs in design. His model therefore highlighted the importance of a place for application and building of ideas and the back-and-forth, iterative cycle as a learner goes between these realms for the creation of knowledge. However, the model fails to show how that may differ and evolve over time for a new or novice learner attempting to develop more expertise in HCD.

Other studies have found an interplay of design methods and expertise development of methods, such as brainstorming and prototyping, in members of experienced design firms (Beckman and Barry 2007; Hargadon and Sutton 1997) and even in successful novice teams learning and applying HCD within an educational setting (Seidel and Fixson 2013). If HCD is to be positioned for wider adoption, then research needs to go beyond the examination of each method into how people new to the methods are capable of learning and utilising the methods in order to develop as a novice (Seidel and Fixson 2013) within the organisational context in which the learning occurs (Carlgren 2013b).

2.6.2 Consideration of learning models for HCD and healthcare

Looking outside design for inspiration yields promising models. While not an exhaustive review of all learning models, this section focuses on how a particular model was found to be useful as a guide for HCD learners.

How best to teach people new to HCD has not been heavily studied in the literature (Seidel and Fixson 2013). Design as an approach to business is a recent phenomenon (Liedtka 2015) and is still in the early stages of development (Carlgren 2013b). To date, most work in the wild has focused on exemplars (Hargadon and Sutton 1997; Stompff 2012), which have provided insights into the ways in which such individuals behave and what they do to perform at such a high level.

New learners, however, have been studied less (Seidel and Fixson 2013), and if design is to impact organisational innovation more broadly, the way in which these novice learners learn and apply design is a critical component (Seidel and Fixson 2013). Detailed stages of learning in context could provide a lens through which the potential stages of learning HCD can be viewed (Benner 1982, 2004; Dreyfus 2004; Dreyfus and Dreyfus 1980).

Benner (1982, 2004) applied the Dreyfus model of skill building (Dreyfus and Dreyfus 1980) to the study of nursing practice and skill acquisition, both of which begin with the

novice learner who then progresses to expert as seen in Figure 2.1 (Benner 1982, 2004).

Figure 2.1: Benner's model of skill acquisition in nursing (copyright Benner 1982)

Benner's research found the Dreyfus model to be useful to the field of nursing, stating:

> The skill of involvement and the development of moral agency are linked with the development of expertise, and change as the practitioner becomes more skillful. Nurses who had some difficulty with understanding the ends of practice and difficulty with their skills of interpersonal and problem engagement did not progress to the level of expertise. Taken together, these studies demonstrate the usefulness of the Dreyfus model for understanding the learning needs and styles of learning (of nurses) at different levels of skill acquisition. (Benner 2004: 188)

There are five stages of development for the learner in both the Dreyfus and Benner models (Benner 1982, 2004; Dreyfus 2004; Dreyfus and Dreyfus 1980). The novice is guided by what is referred to as "rules-based" practices, in that they have not gained experience in practice to know when an approach may work and when it may not. The advanced beginner has approximately two to three years of experience, yet they still rely heavily on mentors and peers who help to guide their practice to the next stage, the competent learner. The competent learner is described as someone who has developed some general guidelines, or "maxims", to help them plan, organise, and conduct their practice (Benner 1982, 2004). The final two stages of this skill

development, proficiency and expert, show that learners are fully comfortable with the methods and have accumulated years of experience and the ability to easily and skilfully navigate complex situations. The differentiating ability of the expert at this stage is their intuition and the ease with which they are capable of making decisions and creating new knowledge (Benner 1982, 2004). The stages of learning as codified in Dreyfus and Dreyfus' and Benner's work could be seen as an extension of, or complementary to, the models that focus on iterative learning through application, practice, and reflection (Dewey 1938; Kolb 1984; Owen 1998).

However, the Dreyfus and Dreyfus and Benner models do not only focus on how learning occurs, but on the progression of the learner. This feature of progression is of importance when tying the literature of novice learners (Liedtka and Ogilvie 2011; Seidel and Fixson 2013) to that of expert designers (Cross 2001; Hargadon and Sutton 1997; Stompff 2012). While the Dreyfus and Dreyfus and Benner models have dissenters (Gobet and Chassy 2008; Shanteau 1992), primarily based on what is perceived as an overly intuitive description of the expert, they have both been seen as valuable frameworks for practical expertise development, clearly demonstrating the learning needs as well as the styles of learners at various stages (Benner 1982, 2004).

This thesis argues that these stages provide a solid platform from which to apply HCD to the HCD learner's journey. This is discussed in more detail in Chapter 6.

2.7 Chapter conclusions

This chapter has explored the literature related to the need for innovation in healthcare and current approaches and challenges to achieving innovation in a healthcare setting. While there is a need for innovation in healthcare and a positive perception of innovation overall, there are a number of challenges to achieve it. These challenges include a broad range of forces against change and innovation, such as the high level of complexity as an industry (Cresswell, Cunningham-Burley, and Sheikh 2017), cultural resistance, a lack of structure to support rapid change and experimentation (Bessant and Maher 2009; Bohmer 2010), and the lack of workforce competencies to innovate (Berwick 2003).

The need for models and approaches for developing innovation capabilities in organisational employees has been identified. HCD has been seen as a viable approach to innovation both inside and outside of healthcare, but it is still not well explored in an organisational context (Carlgren, Elmquist, and Rauth 2014; Carlgren,

Elmquist, and Rauth 2016a; Liedtka and Ogilvie 2011; Seidel and Fixson 2013). HCD, as the focus of this thesis, has been discussed in terms of its impact and application to innovation within the organisation (Carlgren 2013b; Martin 2009) and viewed as a viable approach within a healthcare setting (Roberts et al. 2016). As little as the organisational context has been explored, even less is known about the phenomena in a healthcare setting (Berwick 2003; Bohmer 2010; Coughlan, Suri, and Canales 2007).

This chapter concludes that there remains a gap in our understanding of how to learn HCD and what conditions best support those trying to apply it. The remainder of this thesis explores this gap with the aim of creating actionable approaches to building this capacity in the healthcare workforce.

In Chapter 3, the methodology to address this aim is described.

Chapter 3: Methodology

This chapter describes the methodological approach underlying the research and an overview of the varying methods and designs applied in each of the individual studies. This research is interdisciplinary in nature, pulling literature from the fields of business, healthcare, design, OD, and learning and development. Field studies within an organisation are often diverse and cross multiple fields of traditional study (Edmondson and McManus 2007). The approach adopted here is ethnographic and qualitative, allowing an in-depth exploration of experiences applying HCD in healthcare and drawing on methods from the social sciences and the design field.

The methodological choices and subsequent methods employed in each of the three studies are outlined in this chapter and discussed in more detail in the respective studies contained in Chapters 4 to 6. The reasons for the choice of approach are discussed, along with the framework and supporting research design. Ethical approval for the research was granted by Coventry University and the KP Institutional Review Board.

3.1 The research journey

The premise for the research is the researcher's positionality that there are insights about how HCD has been successfully learned and applied within organisations that can be captured and analysed to provide real-world value to those leading change within large organisations. The researcher has a background as a nurse, a healthcare executive, and most recently, as a leader of an internal HCD practice within a large healthcare organisation. As a result, a long-standing interest has been held in how the approach and necessary skills and capabilities for applying HCD to a variety of challenges are developed and embedded within organisations, especially within healthcare.

As detailed in Chapter 1, the researcher is a practitioner with 14 years' experience leading a design practice and applying HCD and leading others in their application of an HCD approach. This research sought to utilise, but also build on this viewpoint, and capture the experiences of others seeking to learn and implement HCD for change and innovation. The researcher's unique position within KP, the main organisation of focus, was studied, as well as additional external networks. Together they provided access to observe and reflect on a variety of situations that would be deemed unlikely, if not impossible, for an outside researcher.

The HCD learning and application journey within organisations was the focal point, in particular gathering the experiences and insights from learners at different stages of the learning journey and expertise. Three different study groups were identified:

1. Nurses as non-designers who have never been exposed to or trained in HCD methods and yet still seek to champion innovation and change within their workplace;

2. Change agents as exemplars in HCD who have been deemed successful in implementing and sustaining environments for learning and applying HCD approaches for innovation;

3. New learners and expert coaches through a yearlong study of a learning program for HCD and innovation.

The first study involved nurses. This is the largest component part of the healthcare workforce, and opportunities were sought to capture their experiences and needs in leading change and innovation in a natural setting that was outside a patient care environment. These were identified individuals, who sought to champion innovation and change in their job rules, but may or may not have had professional experience or training in doing so. Therefore, the approach leaned on insights that could be gathered from both professional and personal experiences. The results helped to understand the needs for lead innovation and change that could potentially be met though HCD methods.

The second study was developed to capture experiences from those with greater exposure to and application of HCD practices. As application in healthcare is relatively new, participant experiences were sought from a wide variety of industries. An experienced practitioner in the area, the researcher was able to access suitable participants through the Design Thinking Exchange network in which the researcher played a role. The network was employed to guide the selection and recruitment of participants with recognised experience in HCD. The study in Chapter 5 of exemplar change agents sought to identify patterns in the behaviours and conditions demonstrated by these individuals across diverse organisations and industry settings.

To complement these two studies, a detailed study of the learner journey when learning and applying HCD was felt to be of value. The DMI award winning Innovation Catalyst programme at KP was identified as a potential opportunity to study learners'

journeys over a longer period of time. This study is outlined in Chapter 6. The program was identified as best practice in HCD learning programmes. The position of the researcher within KP as a sponsoring organisation enabled ease of access to a new cohort launching study in 2016, which was studied over one year from the beginning of the learning programme until the programme completion.

The three studies which included the nurses at KP, with the cross-industry exemplars, and the new learners and KP HCD exemplars in the Innovation Catalyst programme, all capitalized on the researcher's HCD network. They provided an in-depth study of groups that would otherwise be hard to gain access to, and the researcher position gave additional insight in the development of the employed research tools and analysis through prior and embedded knowledge. As a result, the research provides real-world insights to an organisation otherwise relatively un-studied from the inside. For the researcher, it has provided a new and more holistic understanding and analysis of the journey to learning and applying HCD within an organisational context that will shape personal practice and research passion.

3.2 Research approach

The aim of this research was to explore and create actionable approaches for leaders of change to build a capacity to learn and apply HCD to champion innovation and transform healthcare. The research was exploratory, looking to understand current practice and its perceived effectiveness, and thus, qualitative research was felt to be the most appropriate approach (Boyce and Neale 2006; Edmondson and McManus 2007). Additionally, qualitative methods were appropriate due to the nascent nature of the research topic (Edmondson and McManus 2007) and supported the capacity to explore in depth the nature of behaviour and culture within the organisation. The researcher was familiar with qualitative research methods. This interest, passion, and position have further informed the design of this research and the methodological choice.

The epistemological position of the research undertaken supports a researcher–practitioner stance. The major paradigms are summarised in Table 3.1, inspired by Guba and Lincoln (1994), with the pragmatist approach highlighted in the final column that supports the position of both objective and subjective points of view.

Table 3.1: The major paradigms

Descriptive	Positivism	Interpretivism	Critical theory	Pragmatism
Ontology Is it real?	Objectivist – there is a definitive reality	Reality is co-constructed	Realism is shaped by outside forces	Reality is based on the world we live in
Epistemology Is it true?	Only knowledge is scientific knowledge	Co-created multiple realities and truth	Findings are based on values	Objective and subjective points of view
Methodology How do I examine what is real?	Quantitative – primarily experimental and quasi-experimental	Qualitative and/or quantitative	Usually qualitative, but also quantitative	Qualitative and quantitative

The perspective of a researcher–practitioner in the field created a position that was somewhat entangled with the phenomenon set out to study. The research within a pragmatist tradition enables the researcher to interact with the subject matter and test and verify ideas with users in the context of their practice (Savin-Baden and Major 2013). Dewey (1938) discussed the active involvement of the researcher with the research to develop a pattern of inquiry that brings the researcher into the practice being studied. It is through this involvement and the experimentation of ideas that the problem being studied evolves into an assertion of ideas with potential value to those being studied (Dewey 1938).

The research strategy utilised in this thesis follows the pragmatist position through its use of abductive logic, beginning with an incomplete set of observations and moving on to the likeliest possible explanation (Dewey 1938; Stompff 2012). This approach has been successfully applied elsewhere by researcher–practitioners (Stompff 2012; Weberg 2013), who also assumed a pragmatist stance and utilised qualitative methods of research. The pragmatist approach acknowledges the value of the researcher interacting with participants through qualitative research to shape the output into something of both value and meaning.

In the selection of participants for this qualitative research, two different types of sampling approaches were utilised: convenience sampling and judgement sampling.

Table 3.4 provides an overview of each study and includes the sampling approach. Because of the sampling approaches utilised, members of the general population did not have an equal chance of being selected as neither of these approaches are randomised. While this can minimise the generalisability of the output, generalisability is not the ultimate goal of qualitative research; validity is the goal. Convenience sampling and judgement sampling were selected to allow for the study of a phenomenon that does not exist in the population in general, which is the learning and application of HCD within a large organisation.

Convenience sampling is a type of non-random sampling that targets members of a certain population who exhibit the necessary criteria (Savin-Baden and Major 2013). In this case, the criteria included individuals who were not designers and had not received training in HCD, healthcare workers who were ideally nurses, ease of access within a certain timeframe, and the ability to reach an audience of over 25 people in person at one time in a natural setting and a high likelihood of participation. The convenience sampling opportunity arose to access 200 nurses who would be attending a meeting for their union responsibilities. The researcher was able to use their relationships with other leaders within KP to solidify an opportunity to conduct a data gathering activity with this group of nurses. The output of the study is found in Chapter 4.

After this initial data gathering, judgement sampling was utilised for the remainder of the research. Judgement sampling is the deliberate selection of participants due to the qualities and attributes that they possess (Savin-Baden and Major 2013), and it is frequently deployed in qualitative research to identify and select the individuals or groups of individuals that are well informed with the phenomenon of interest that is being studied (Cresswell and Clark 2011). The criteria for this judgement-sampling approach are found in Chapters 5 and 6. The participants were believed to have the ability to provide the most information-rich stories and experiences to contribute to the research. The researcher had clear criteria for the judgement-sampling approach but was aware of the risk in biasing the choice-based personal connections and experiences. To help counter this, guidance was sought from outside peers who ultimately concurred with the majority of identified participants and suggested additional research participants who met the judgement criteria but had previously been unknown to the researcher.

3.2.1 Field research

The research was structured into three studies, as discussed earlier in this chapter, detailed in Chapters 4, 5, and 6. These were undertaken in the real world, in this case, typically within the workplace. Field research has been defined as the collection of original data, either qualitative or quantitative, within real organisations (Edmondson and McManus 2007).

The complexities for approaching the work in this way were significant, and many adjustments were made along the way, as is expected in field research.

> Although the potential relevance of field research is motivating, the research journey can be messy and inefficient, fraught with logistical hurdles and unexpected events. Researchers manage complex relationships with sites, cope with constraints on sample selection and timing of data collection, and often confront mid-project changes to planned research designs. (Edmondson and McManus 2007: 1155)

Research in a highly regulated and complex industry such as healthcare is particularly challenging, particularly access to participants and the requirements around ethical approval. A continuum has been proposed that ranges from nascent early-stage research to more mature research that builds on existing constructs (Edmondson and McManus 2007). Table 3.2 aids in describing this continuum. As noted, field research fits with the approach taken to a nascent, emerging area.

Table 3.2: Three archetypes of methodological fit in field research (Edmondson and McManus 2007)

Whilst HCD is not a new approach, its application to staff-based innovation in healthcare and study of the phenomena is in a nascent research state (Bessant and Maher 2009; Carlgren, Elmquist, and Rauth 2016c). Understanding how HCD is actually learned and practised in reality through ethnographic field research was felt to be important. The data collection was primarily undertaken in the field to enhance the opportunities available to understand the individual perspective of the participants involved within a more natural context and in line with design research methods and an HCD approach. It may be tempting to pull quantitative studies into research in an attempt to speak to the validity of the work; this practice is discouraged by researchers who focus on field studies and early-stage research (Edmondson and McManus 2007). Some go so far as to suggest that those studying nascent theory are at risk of going on

“fishing expeditions” in their attempt to find quantitative measures before the phenomena itself is better understood through qualitative efforts (Edmondson and McManus 2007: 1171). Whilst quantitative methodologies might have generated clear and powerful results, it would have been deficient in revealing relevant insights about such a nascent topic and would not have provided an understanding of why participants do what they do, which was a focal question for this research.

3.3 Research design

An exploratory, flexible study design was relevant, as it allows for the study of an issue before enough is known to conduct a more formulaic research design (Neuman and Kreuger 2003). A flexible research strategy (rather than a fixed one) enables an evolving design as the research proceeds. This enabled studies to be designed in response to findings, as is often needed in early-stage research topics. This was felt to be most appropriate to a research area involving the study of people and within a specific organisation in a way that was exploratory and descriptive (Savin-Baden and Major 2013) to begin an approach to theory building. Ultimately, the most valuable theory is a theory that can be used in practice (Talisse 2002) is based on the best available knowledge and does not strive for an ultimate truth (Barcelos 2000; Dewey 1938). This research took steps to begin this theory-building process, starting with the creation of exploratory models and frameworks.

3.3.1 Qualitative methods in design research

The specific qualitative ethnography strategy adopted enabled exploration of HCD in application at KP and the wider context surrounding it, as opposed to testing a hypothesis (Hammersley and Atkinson 2007; Reeves, Kuper, and Hodges 2008). Qualitative in-depth study allows the identification of a practical problem and the synthesis of the data into a warranted assertion (Stompff 2012), thus leading to both plausible (Savin-Baden and Major 2013) and useful research that can impact practice. A particular strength of qualitative ethnographic research is the ability to gather data that reflects the subtleties and complexities about the subjects of the research and their context, which are often missed by more positivistic enquiries (Anderson 2010).

Inanimate objects and environmental cues help to provide these subtleties, and they were a key feature to be researched in this work, for example, through design outputs, and the nature of observations undertaken. Ethnographic observations of people and the context of their work requires strategies to capture the dynamic at play and reveal the unseen interactions or personal biases of those being studied (Savin-Baden and

Major 2013). The approach taken relied on leveraging the expertise the researcher had to apply towards the analysis of the information obtained. As noted by Miles and Huberman (1994: 10), “The strengths of qualitative data rest on the competence with which their analysis is carried out”.

Qualitative methods offer the opportunity to capture and offer explanations about the behaviours and patterns seen across the diverse participants in this nascent space. Researchers in a growing community of practice also tout the legitimacy and value of qualitative research as a valuable approach to expanding organisational knowledge (Eisenhardt 1989; Hammersley and Atkinson 2007). With an espoused goal of exploring the experiences of individuals learning and applying HCD, the methodological approaches selected for this research support that endeavour and are enhanced by the researcher’s increasing assimilation as a participant in the observed field to gain an insider’s knowledge of the phenomena (Hammersley and Atkinson 2007).

Bridging the gap between design practice, design theory, and research through a range of approaches and qualitative research was felt to be important (Edmondson and McManus 2007; Holloway and Todres 2003). This range of approaches provided a flexibility in methods while leveraging the assets of active field studies for new and novel knowledge creation (Hammersley and Atkinson 2007; Reeves, Kuper, and Hodges 2008; Stompff 2012).

3.4 Research methods and design tools

To capture multiple points of view, a range of research methods were employed to explore the research context and support methodological triangulation of the phenomena. It was recognised that more than one research approach can be taken to explore a phenomena and here, traditional research methods were employed alongside design-driven approaches such as journey mapping. The result was a set of models and frameworks seeking to explain what was observed.

This research involved working professionals and was often undertaken during the course of their workday within the field. The approaches, therefore, needed to provide a good fit within the constraints of time and availability of participants. Choices were made to optimise both quality and the time available by participants to best contribute to the overall validity of the study (Saunders, Lewis, and Thornhill 2008). It has been argued that combining qualitative interviews and ethnographic observations are

recommended (Edmondson and McManus 2007) and that these forms may allow more depth of understanding.

To accomplish this, the qualitative interviews and ethnographic observations were enhanced by the use of HCD methods including empathy and journey maps, artefacts, and co-design workshop, which are discussed in Table 3.3 and described in more detail in the respective chapters.

Table 3.3: Data collection methods

Data collection approach	Description and justification	Additional information
Semi-structured interview questions	How individuals reflect on history lends insight into their actions in both the present and future (Stacey 2007). Semi-structured interview questions were conducted to gather this history and balance comparable questions across participants with an opportunity for participants to add in additional detail and direction.	Chapter 5
Empathy map	How the use of design tools support deep user storytelling and provide context (Hanington and Martin 2012; Kumar 2002).	Chapter 4
Journey map	How the use of design tools support deep user storytelling and provide context (Hanington and Martin 2012; Kumar 2002).	Chapter 5
Artefacts	Artefacts, such as educational materials for teaching HCD and presentations shared with the learners, were included, as were the notes captured during the co-deign sessions.	Chapter 6
Observations	Observing learners and those teaching them demonstrate the context of the occurrences and change in events over time (Creswell and Miller 2000; Lincoln and Guba 1985; Ponterotto 2006).	Chapter 6
Co-design workshops	Co-design with users was used in a variety of healthcare settings to gather and iterate feedback (Bate and Robert 2006; Bessant and Maher 2009; Bevan et al. 2007; Boyd et al. 2012; Mugglestone et al. 2008). Trustworthiness of data can be enhanced by working with participants to co-create meaning (Savin-Badin and Major 2013).	Chapter 6 Chapter 7

3.5 Overview of Individual studies

Yin (2013) suggested that to cover a broad range of complex conditions and contexts, study data should come from multiple sources of evidence. Additionally, to enhance the trustworthiness of the research overall, reviewing multiple cases is a viable approach

(Savin-Badin and Major 2013). As outlined above, three studies were undertaken. Each study and the methods used are shown in relation to the overall research approach, objectives, and methods in Table 3.4.

Table 3.4: Research objectives and approaches

Chapter	Study aim	Method	Participants/ selection	Data collection tool	Data	Analysis
2 Literature review	To explore the state of the literature for context, perspective, and gaps as learnings progressed	Literature				
4 Non-designers' experiences of leading innovation and change	To understand the individual front-line healthcare staff experiences and enablers associated with being a champion of innovation and change on a personal level	Qualitative interview; literature review	125 nurses Convenience sampling	Empathy map-directed questions	Interview; transcripts; artefacts	Thematic analysis
5 Exemplars' experiences developing HCD across industries	To explore the experiences of successful change agents in learning and applying HCD and to translate the learnings into useful models for organisational leaders	Qualitative interview; literature review	9 experts and thought leaders; 15 organisational "change agents" Purposive sampling	Semi-structured questions; journey map	Interview transcripts; artefacts; member and peer checking	Thematic analysis

Chapter	Study aim	Method	Participants/ selection	Data collection tool	Data	Analysis
6 Learners' and coaches' experiences developing HCD within healthcare	To explore the experiences of HCD learners within a healthcare organisation through a longitudinal study and translate the learnings for organisational leaders and learners; to demonstrate the evolution and utilisation of the theoretical models developed from the empirical research	Observation; literature review	45 learners; 8 "coaches" assigned to learners Purposive Sampling	Journaling; visual models; co-design workshops	Interview; transcripts; artefacts; member and peer checking	Thematic analysis
7 Theoretical model development		Workshop	Purposive Sampling Convenience sampling	Artefacts	Member and peer checking	

In the following sections, each study is summarised to provide more context and to demonstrate the multiple viewpoints, methods, and time horizons (Bryman and Bell 2015). Each study had an approach to maximise learnings and opportunities available, and the methods were chosen accordingly.

3.5.1 Study 1. Non-designers' experiences of leading innovation and change

This study included hospital- and clinic-based nurses who had not previously been exposed to or trained in HCD. The study aimed to understand the individual front-line healthcare staff experiences and enablers associated with being a champion of innovation and change on a personal level. This study employed a workshop with empathy mapping to collect data.

Two workshops were undertaken, involving 125 participants. This approach provided access to a large sample of nurses as learners in a short period of time. During this time, they were provided with a design research tool, called an empathy map, and asked to reflect on a point in their lives when they felt like a champion of innovation and change. The nurses were walked through the exercise and their responses were collected for analysis after the workshop. This approach afforded the anonymous requirement for the engagement while still taking advantage of the in-person and interactive nature of the activity with a broad and diverse set of nurses at a defined point in time (Flick 2011).

Nurses were an important group to reach for this research because they make up the largest segment of the healthcare workforce (American Association of Colleges of Nursing 2012) and represent non-designers who may have opportunity to apply HCD approaches. More detail on this study is found in Chapter 4.

3.5.2 Study 2. Cross-industry study of exemplars' experiences developing HCD within the workforce

The second study aimed to explore the experiences of successful change agents in learning and applying HCD and to translate the learnings into useful models for organisational leaders. This was explored through semi-structured interviews.

The study focused on individuals considered organisational change agents who had successfully brought HCD into their organisational workforce to aid in innovation efforts. The study was designed to provide another perspective on the phenomena of learning and applying HCD inside a large organisation.

The change agent participants were identified as successful exemplars and were asked to reflect on and map their journey over many years using another HCD tool, a journey map. They then participated in a qualitative interview session to explore their experiences. The journey map exercise supported their personal narrative by providing a visual by which to display their experiences and emotions across many years. The journey map was also used to compare and contrast what they had shared in response to the interview questions. Shifts over time and contradictions in their shared experiences, as well as changes in individual practice with time and experience, were highlighted in the data analysis.

These individuals were an important group to study because they provided context for the broader study. Their experiences conveyed conditions and behaviours that enabled them to successfully accomplish the phenomena, thus providing a counter viewpoint to the staff nurses as non-designers who had not been exposed to HCD. More detail on this study can be found in Chapter 5.

3.5.3 Study 3. Experiences learning and applying HCD within healthcare

A more longitudinal research study was developed to better understand the learner journey. The third study aimed to explore the experiences of HCD learners within a healthcare organisation through a longitudinal study and translate the learnings for organisational leaders and learners. It sought to provide live field study experience with learners, or novices, and their expert mentors in real time during the HCD learning and application process in a variety of healthcare organisations. The longitudinal study provided a better understanding of the change and development that occurs across the learning journey over time (Goddard and Melville 2004).

The study focused on the Innovation Catalyst programme, studied from the point it launched through to the following year when it concluded. Studying the Innovation Catalyst programme over a 12-month period was deemed the best approach to observe changes in the learner over time (Creswell and Miller 2000; Lincoln and Guba 1985; Ponterotto 2006).

The data collection included multiple methods, including observations, ethnography, artefact analysis, and user input. This was an important group to study because it provided real-time exposure to learning and applying HCD within a large organisation, which could be compared to the reflection provided in the other two studies. The perspectives of new learners of HCD as well as their mentors, called coaches, within

healthcare were studied to understand and identify insights or patterns that occurred over time. More detail on this study can be found in Chapter 6.

3.5.4. Model development

The findings from the three studies informed the development of models. In the pragmatist positioning, truth and quality of the research outcome is ultimately judged by the usefulness of the outcome. This led to the choice of co-design sessions after the completion of the three studies. This co-design approach provided a venue for member and expert checking of the developing models, discussed more in pages 56-61.

Co-design as an approach to shape output with users has been used in a variety of healthcare settings to gather and iterate feedback (Bate and Robert 2006; Bessant and Maher 2009; Bevan et al. 2007; Boyd et al. 2012; Mugglestone et al. 2008) and was deemed a valuable approach for informing the development of the theoretical models and guiding frameworks.

3.4.5 Reflection on the pragmatics of research design

The data collection methods in this research were selected to optimise the input from the participants, considering the time constraints placed upon them by the demands of the working environment. Wherever possible, existing fora and organisational meetings were leveraged as points to collect data. The nurses who participated in the study in Chapter 4 had few hours available, and data needed to be collected from 125 nurses simultaneously. The empathy map was seen as a viable design tool to aid in the collection of the novices' latent and unarticulated needs (Kelley and Kelley 2012; Vianna et al. 2012).

In Chapter 5, the exemplars referred to as change agents were interviewed using a combination of semi-structured interview questions and a journey map. When paired, this allowed for a comparison of tensions and inconsistencies in the data (Liedtka 2015) and provided deep context to the exemplars' stories during the interview process by the way in which the stories and experiences unfolded, as collected in the journey map.

Data from the new learners and the experts was gathered in Chapter 6 using observations during existing meetings over a period of one year to track the context of the experiences in both the organisational setting and the Innovation Catalyst programme in which they were learning and being coached. In addition, artefacts from

the experiences provided tangible outputs of teaching and learning experiences to round out the observations. The timeframe for data collection for the learners and the expert HCD practitioner coaches was one year. This allowed comparisons and changes to be tracked across multiple points in time, often four to six times a month. Fifty-three people were a part of the longitudinal study, displaying a wide range of experiences to study.

As an approach to minimise researcher bias (Creswell and Miller 2000), triangulation used for this research was a collection of data at multiple points in time and from multiple people, as well as triangulation from multiple methods of data collection (Hammersley and Atkinson 2007; Savin-Baden and Major 2013).

3.6 Analytical approach

Thematising meanings is one of the primary skills in qualitative analysis (Holloway and Todres 2003). Thematic analysis is a widely used qualitative method for analysis (Braun and Clark 2006; Roulston 2001) in the social sciences field (Braun and Clark 2006; Holloway and Wheeler 2010). It consists of methods to take data created by people and events and to make meaning from it (Boyatzis 1998; Braun and Clark 2006).

While the studies within this thesis provided a richness in the data and its sources, it also created the risk of having an overwhelming amount of data to review. Collecting and sorting through it all was challenging at times for the researcher, and it was this challenge that led to the application of the design-driven approach of visualisation and physical sorting of data towards the thematic analysis effort.

The visualisation and physical sorting was undertaken using a paper-based approach, rather than using software tools for thematic analysis. It is a common practice in HCD to support collaboration from multidisciplinary teams during HCD efforts that are visualised (Chasanidou, Gasparini, and Lee 2015; Liedtka, 2015). Expertise as a practitioner in design was applied to the implementation of the analysis process. The method followed is documented in Table 3.5 and described in more detail in this section.

The data gathered during the research was varied and included physical artefacts from design sessions as well transcribed interviews. Some of the benefits of thematic analysis are its flexibility, clear approaches, and guidelines (Braun and Clark 2006) which were deemed necessary for this type of research. The primary phases of

thematic analysis according to Braun and Clark (2006) include familiarising yourself with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and finally, producing a report. Throughout this research, coding frequencies were the constant comparative method used between studies as is often adopted in this approach (Holloway and Todres 2003). These approaches yielded a solid base understanding of the data to create the final insights and models.

This method focused on highlighting the needs of internal practitioners and what they did to be successful. Thus, the elevation of positive and negative experiences was deemed to be important and a significant approach to the initial sorting of data. The first step was to review the documents in their entirety for overall meaning. Then, colour was applied to the transcribed text or noted by coloured Post-it notes on artefacts, such as journey maps or empathy maps, to capture comments and experiences that were enablers or detractors from being a champion of innovation and change. A colour key stating the meaning of each colour was maintained on a separate document for clarity. Notes in red or pink represented negative comments; blue or green represented negative comments. The comments that were more neutral emotionally, but interesting in nature, were captured in yellow and reviewed in more detail as the analysis continued.

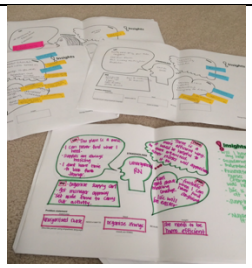
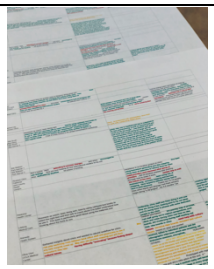
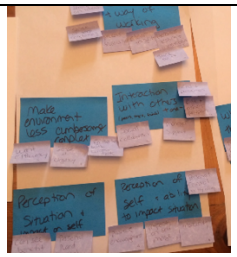
Small Post-it notes were applied to the raw data for initial codes along with the associated quotes. To begin, there were a great deal more categories than plausible for interpretation. After a few rounds of consolidation and sorting, more meta themes emerged. The flexibility of the Post-it notes allowed the codes to be moved around in different organising themes easily. These themes were sorted and resorted to challenge the clarity and assumptions behind the themes. With each change, a photo was taken for reference and cross-comparison of the evolution of the themes. After an average of 10 to 15 different sorting approaches had been conducted, the photos of the themes were reviewed for additional insights and patterns utilising a mix of process rigor and researcher–practitioner intuitions. A final sort was then made into what was believed to be the most representative and robust insights for the research aim.

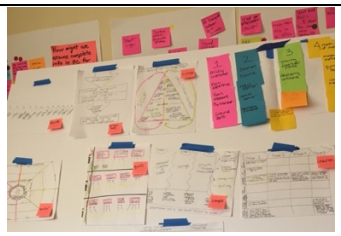
Frameworks and insights were created that highlighted the insights in multiple ways to provide a variety of visualisations for user input and feedback. They were printed and displayed on tables and wall surfaces for easy viewing, editing, and deliberation by participants in co-design sessions. These co-design sessions allowed member and peer checking for quality in the analysis (Savin-Baden and Major 2013).

The co-design process began with creating short descriptive videos for each of the frameworks, which aided in providing each participant an opportunity to familiarise themselves with the work. They were also provided with an additional 15 minutes of time for reflection at the beginning of the co-design sessions. They were then encouraged to silently write their feedback and re-sketch the models were needed, followed by a verbal sharing by each person in the session. This occurred in sessions of one to three people at a time to encourage expression and diversity of thought. After each session, newly printed frameworks and insights were provided to the new participants. All artefacts were gathered and compared for themes.

Thematic outcomes were reviewed and adjustments made until the insights and frameworks were supported by a majority of the participants. The notes were captured in a spreadsheet where shades of green demonstrate 90% complete agreement, and yellow represents over 75% agreement in the components of the insights and frameworks. Table 3.5 captures the process steps taken.

Table 3.5: Data visualisation and analysis process

Review of transcribed documents and research artefacts; colour coding applied upon second review	 
Initial coding with participant quotes	
Codes into organising themes and iterated until final themes developed	

Insights, themes, and model created for co-design session and printed for each participant	
Co-design participants provided written and verbal feedback independently after individual reflection	Some materials have been removed from this thesis due to Third Party Copyright. The unabridged version of the thesis can be viewed at the Lanchester Library, Coventry University.
Outcomes reviewed and iterated by participants to achieve majority agreement	

In summary, hallmarks of this process were the physicality and visualisation of data. These provided the opportunity to create layers of elements to aid in quicker categorisation, including words, images, and colours, and to break the large amounts of data into smaller parts for clustering and sorting. The approaches allowed for the ability to sort and resort the smaller parts of data into codes and themes, and to capture and review the iterative rounds of sorting and the utilisation of all these approaches for collaboration and input by participants.

3.7 Quality of research

The quality of research has been discussed using various terms and nuances in the literature, but for this study, Savin-Baden and Major (2013) and Hammersley and Atkinson (1995) provided the primary lens. Studies undertaken in line with a qualitative ethnographic approach and involving a researcher embedded within the environment offered significant opportunity. The value to the approach is the level of insight and access to the area provided. To counter the challenges of bias in qualitative work of research–practitioners (Stompff 2012), efforts were made to include approaches that enhanced the trustworthiness and triangulation through member and expert checking. Additionally, data was gathered across differing time periods and through multiple methods for methodological triangulation (Savin-Baden and Major 2013). Member and

expert checking and co-design are discussed as to the implications on the quality of research.

Keeping personal experiences out of the initial coding was a challenge for the researcher. There was a natural inclination to take advantage of the insights that 15 years of personal experience had to offer. Through journal reflection, it was noted that there was also a risk of listening selectively to the participants and processing observations through the bias of experiences, which was countered in a few ways.

One way was to involve participants who were deemed organisational exemplar change agents, from outside the researcher's professional network. Selection criteria were used to determine who to involve, which, along with adding new people from outside the researcher's network, also omitted some people within a personal network who were initially flagged as potential participants. In the end, it provided more confidence in who was chosen and led to some unexpected participants who would not have been included otherwise.

Another counter to bias was the inclusion of member and expert checking. This was performed through co-design sessions to enhance the trustworthiness by research participants, thus enhancing the quality of research overall (Savin-Baden and Major 2013). Members and experts were invited to provide their feedback through co-design workshops to enhance the research rigor (Anderson 2010). These participants contributed to the learnings with the goal that the outcomes should improve pressing issues in their lives (Meyer 2000). Co-creating meaning in this way also enhances the trustworthiness of data by working with participants (Savin-Badin and Major 2013).

Co-design workshops was another approach applied to develop additional quality checks for bias and to elaborate on the real-world applicability of the research. The term co-design is used in the work of user research and in the design field (Boyd et al. 2012; Mugglestone et al. 2008), and it has its foundation in participatory and collaborative design and research which began in Scandinavia (Naranjo-Bock 2011). Co-design has been used in healthcare in England for twelve years, according to literature (Bate and Robert 2012).

Co-design as discussed in the healthcare literature is often referring to the inclusion of patients in the design process, but co-design as an approach is about the involvement of the key stakeholders who will be impacted by the ultimate output. Boyd et al. (2010)

offered a description of co-design workshops useful in this context and provided relevant examples of the approaches used within the workshops

> Co-design workshops provide a wide variety of people who have an interest in the project getting together in one place to discuss issues, learn together and make decisions. These workshops may be based around starting up a project, understanding patient or staff experiences or delving in-depth into an issue (journey mapping or idea groups) or coming up with tangible solutions (using tools such as prototyping). (Boyd et al. 2010: 1)

The co-design process utilised for this research is recounted in Section 3.6. In terms of the quality discussion, the sessions provided the members, meaning those involved in the work, a voice in the findings and identified ethical misinterpretations on the part of the researcher (Savin-Baden and Major 2013). Following member checking, thought leaders from a diversity of organisations and industries were included to conduct what is often referred to as expert checking (see Chapter 7). The thought leaders were selected for their expertise in the topics, and their range of viewpoints provided thorough exposure to organisational and academic experiences across settings. They reviewed the final models in the co-design sessions and provided feedback through two different iterations. The researcher believes that these co-design sessions, even though complex and time consuming, provided a great deal of diversity of thinking and feedback on the researcher's interpretation of the ethnographic data and the usefulness of the research output for practitioners. Table 3.6 displays that models and frameworks were used to aid in the interpretation of the data with the participants, and their input led the evolution over one year.

Table 3.6 Co-design workshops in order of occurrence

Workshop session	Venue	Number of participants	Focus of feedback
Innovation catalyst coaches	In person	5	Assess understanding and interest in model generated from study of exemplars
Innovation Learning Network (ILN)	In person	18	Transferability and perceived value of model to 11 different healthcare organizations
Innovation catalyst coaches	Virtual video	6	Transferability and perceived value of applying model developed in study of new learners to KP
Design Thinking Exchange (DTX)	In person	10	Perceived value and application of both models in additional cross-industry organisations and academic institutions
Individual video feedback sessions with ILN, Catalyst coaches and DTX participants	Virtual video	5	Collecting cross-industry and academic use cases and making minor modifications
Innovation catalyst coaches	Virtual video	8	Capture of final perspective accuracy and usefulness of all models and frameworks

These co-design workshops were held with varying participants and provided an approach for diverse member and peer checking across studies. The ethical considerations pertaining to this and the other studies are now discussed.

3.8 Ethical considerations

The research design was guided by ethical principles with an awareness of the specific challenges of undertaking research in healthcare. KP, where over half the research participants were employed, follows the guidance of an independent ethics committee, the Institutional Review Board (IRB). The research was approved by the IRB within KP, as well as the Ethics Review Committee of Coventry University. Requirements for both overseeing bodies were fulfilled and maintained during this research.

IRB committees are based within organisations and adhere to a strict set of guidelines to formally approve, monitor, and review research. The review body was set up to protect both the people working within and those being cared for by the healthcare organisation. Their goal is to protect the rights and welfare of the people participating as subjects in the research conducted within their organisation, empowered with this responsibility by the Food and Drug Administration and the US Department of Health and Human Services (HHS) per the regulations stated in Title 45 Code of Federal Regulation Part 46 (HHS Code of Federal Regulations 2010).

The three key issues addressed through the research design and reviewed by the IRB were inclusion and diversity, privacy and security, and recruitment and provision of consent. For inclusion and diversity, participation in this research was voluntary. Within the KP workforce and for the other organisational representatives included, none had a direct reporting relationship to the researcher at the time of the study. No patient participation was included, and the research focus was on individual employees working within organisational settings. Omitting direct patient contact aided in gaining the complex approvals necessary to conduct the study. Active steps were taken to recruit interview candidates, with male and female represented in equal measure.

To balance privacy with risk, a waiver of documentation was granted by the IRB, and implied consent was determined adequate and more appropriate for this study. The rationale states that consent is still obtained from participants; however, they are not required to sign the consent form. Because the only record linking the research participant and the research is the consent document, the research presents no more

than minimal risk of harm to participants. Data security was maintained by leveraging the secure network and tools provided by KP.

Participants were selected through both purposive and convenience sampling, and their recruitment ensured the ability to opt out of the study with no repercussions, which was stated either verbally or through written correspondence depending on the study. A discussion of consent and research process also took place during the in-person or virtual discussions with participants. The participants who were asked to participate through email, per the IRB, were not asked more than twice, to eliminate the chance of coercion. Those who were asked in person were nurses in the study of non-designers, and they were provided with an anonymous way to opt out of the study. The artefacts they turned in did not contain names, and they were encouraged not to turn in their study artefact at all if they were not comfortable with it being viewed by the researcher. The privacy of all participants was maintained through data collection and analysis through the ability to anonymously submit study artefacts. When participant tracking was required for data analysis, as was the case with the study of exemplars and new learners, the use of pseudonyms and coding in notes and transcripts was utilised. This process for obtaining permission from participants was created and followed throughout the research.

3.9 Reflections and research issues

A range of ethical considerations was addressed during the research design and delivery to include inclusion and diversity, privacy and security, recruitment and consent. These are always important issues to address in research, especially in healthcare. Patients were not involved directly in the research, but the role of healthcare staff required consideration and additional approvals as outlined in Section 3.8. In the experience of conducting this research, it was noted that the research processes optimized within healthcare at that time was a quantitative approach for more intermediate and mature research. Conducting nascent qualitative research was a challenge due to the IRB process, which requested a detailed plan of the research approach, methods, and participants before the studies could begin. This affected the research plan in that it created the need to seek additional input outside of healthcare for more exploratory semi-structured interview approaches. This led the researcher to seek out cross-industry exemplars in HCD implementation, leading the study that propelled the concept of the microclimate model. In the end, the shift was beneficial to the research and provided additional perspectives and peer checks that enhanced the outcome. Seeking recommendations for participants and filtering them through a basic

criterion also expanded the network of participants included, using this judgement-sampling approach.

Conducting the study of non-designers who shared their experiences attempting to lead innovation and change was fairly straightforward. The convenience-sampling approach created an opportunity to reach far more nurses at once than the research plan had estimated, which was a delightful surprise. The participants were not known to the researcher, and all data collected was anonymous, and keeping a reasonable amount of objectivity was easy in this situation.

A different experience was felt during the study of new learners and their coaches, who were exemplars in the HCD field. A majority of the coaches had either worked with or worked for the researcher for a number of years during their career. Even though the researcher was not in a supervisory position over the coaches during the time of the research, the relationship could have affected the participants' viewpoints and choice in participation. Specifically, in relation to the design of this research and the role of the researcher, a number of considerations were made. As a researcher–practitioner potentially working alongside the participants, there was careful wording of communications regarding recruitment. It was made clear that participation was voluntary, and declining the invite to participate would not have negative consequences. There was also careful reassurance provided over confidentiality given the working relationship between the researcher and some participants. It was made clear that information revealed through the course of the study would be anonymised and would not be shared in detail with the case study organisation.

There were also likely dynamics in the relationship that could affect both how the researcher observed the interactions and how the coaches provided feedback to the researcher's models. Effort was needed to be conscientious about bias in this situation when collecting and interpreting the data. It was natural to make assumptions about what was being observed and to jump to premature conclusions. This influenced the decision to have all conversations recorded and transcribed by an outside party using pseudonyms and to include other individuals outside of the KP coaching group to participate in the co-design feedback sessions.

Still, there were positives that came from the familiarity of this researcher–practitioner approach. The research ontological perspective utilises participant observation as a research method, and the research design took advantage of this position, along with the deep understanding of context to go into more depth into questions and follow-up

discussions. An additional advantage is that as a practitioner, it is possible to “see” and “hear” what others potentially cannot. This experience had continued to develop stronger observational skills through the rigor of approaching in in a more academic way. Being able to blend both the experience and perspectives of a practitioner and insider, with the rigor of an academic approach, revealed a number of insights about the coaches’ perspectives of new learners and about the impact of the learning environment. This ultimately shaped the design competency model and roadmap. It was also noted that the insider relationship provided more open access to conversations and the participants’ time in shaping the output than would have likely occurred in its absence.

The unique practitioner research role, and the advantages and limitations that this bestows, guided the original contributions made and hoped to inform how HCD will be used to create new solutions in the future. Regular reflection on the role of a practitioner–researcher embedded in the organisation of focus ensured alignment of my work in the day job with the needs of others within KP and externally that seek to apply HCD in healthcare. While the data collection, analysis, and interpretation was a challenge in balancing the role of an internal HCD practitioner with the role of the researcher, efforts were made to leverage its value while creating check points to test the quality of the data through iterative testing of ideas, findings, and resulting models with member and peer checking and thoughtfully planned co-design sessions.

The methodology employed sought to prioritise the need to lead innovation and change within an organisation. It led to an in-depth research study, seeking to further explore and document efforts in this area. The study design aimed to be rigorous and documented for repeatability whilst acknowledging the experience as a practitioner.

3.10 Chapter conclusions

This chapter outlined the research methodology adopted for the set of three studies. The framing provided a deeper reasoning as to why qualitative approaches were a methodological fit for this research. The research was approached using a qualitative ethnographic methodology that supported the study of the social phenomena of learning and applying HCD, as well as the exploration of the nature of and context surrounding it within an organisation. A pragmatist stance was taken to represent the researcher’s belief in interacting with the data and learning both through observations and experiment. Additionally, this stance is recommended for nascent topics that are exploratory in nature, further supporting the qualitative methodological fit. Three

different studies with varying types of method and data source across time allowed triangulation of findings to support the resulting development of models.

These methods provided data that was transcribed and analysed through thematic coding. Input through peer and member checking through co-design sessions further enhanced the quality of the research. Each study adopted a study design appropriate for opportunistic and evolving field studies and ultimately provided the iterative approach between theory and practice that aids a researcher–practitioner to contribute to this new but growing field of study of HCD. What remains is a set of models and frameworks that have been driven by the needs of a broad group of users and shaped by their input over the course of nearly two years.

In Chapter 4, the first study is introduced. Individuals who had never been exposed to HCD provided insights about their needs in attempting to champion innovation and change. Thus, the learning about these phenomena begins.

Chapter 4: Non-designers' experiences of leading innovation and change

4.1 Introduction

The UK's NHS has used HCD for multiple efforts (Bessant and Maher 2009; Bevan et al. 2007) and it is now being seen as a way for healthcare services to actively engage and innovate with patients (Bessant and Maher 2009; Cain et al. 2012) and staff (Lin et al. 2011). It has been posed that HCD methods may even be a more effective engagement approach than the improvement methodologies most commonly used in healthcare (Bevan et al. 2007). To this point, HCD has been a useful approach to healthcare innovation, but as discussed in Chapter 3, how to build individual capacity and the conditions to support it have not been well researched (Carlgren, Elmquist, and Rauth 2016c; Schreyögg and Kliesch-Eberl 2007). Seidel and Fixson (2013) studied student learners, referred to as novices, and identified practices that help to make teams more successful. However, there is a lack of research exploring this from an internal healthcare perspective.

In this research, HCD was studied at the various stages of adoption, through the experiences of individuals with different levels of expertise. The study outlined in this chapter therefore focuses on the perspective of healthcare practitioners working within organisations, who are interested in HCD as an approach to innovation and change but have not yet received exposure or extensive training in the methods.

The participants were nurses, who worldwide make up 50–80% of the healthcare workforce (David 2012). In trying to better understand the experiences of employees within the workforce of the healthcare industry, it is critical to capture perceptions and experiences of this population. While for the most part, this population had not been trained in HCD at the time of writing per nursing union leadership, it would be remiss to omit their viewpoints on what conditions are needed to empower champions of innovation and change within healthcare. Given that they were not positioned as actively leading innovation within the organisational setting, their perspectives were gathered on innovation and change more broadly.

4.2 Aims and objectives

The aim of this study was to understand the experiences, emotions, and activities associated with being a champion of innovation and change through the individual

experiences of those who have not yet received training on HCD and innovation. The specific objectives were to

- explore the experiences of and emotions associated with those interested in becoming “champions of innovation and change” but who have not had the benefit of training, both inside and outside the work context;
- identify overarching conditions, actions, and consequences that surround the phenomena.

4.3 Method

This study was approved by the KP IRB panel and the Coventry University Ethics Review Committee, as well as the United Nurses Associations of California (UNAC) and the Union of Health Care Professionals (UHCP) leadership.

The study was undertaken in February and March 2015. It focused on nurses who had not been trained in design methods in order to explore experiences and perceptions of their approach to innovation. Data collection occurred through two in-person workshops, using a design tool called an empathy map to collect the nurses’ perspectives and insights.

4.3.1 Context to the study

The nurses who participated in the study worked in clinical practice in either the hospital, clinic, or home healthcare setting, and all had been selected for union leadership roles by their peers. The context for the workshops was their quarterly shop stewards meeting at which, in addition to this research exercise, they discussed the “nursing workforce of the future” and their role in helping to prepare their peers for what might lie ahead. Several factors were highlighted by the union leadership that prompted the need for innovation: the rapid introduction of new technologies, the financial pressures in healthcare, the ageing workforce and population, and the subsequent shift in patients’ expectations about how and where care is delivered to them. Innovation and designing new solutions had not been a common topic at these sessions in the past per the union leadership executives.

The behaviour of “being a champion of innovation and change” was selected as the phrasing for this study exercise for three reasons: (1) It was a core behaviour that every nurse in the study had as a part of their performance review within the case study of KP, (2) during the cross-industry study of organisational exemplars (Chapter

5), the phrasing resonated with the interviewees as a worthwhile behavioural goal to pursue within their own organisations, therefore aiding the applicability or fit of the research (Guba 1981), and (3) it aligned with the qualitative interview approach of asking a descriptive question to inquire about what is happening or has happened (Charmaz 2002).

4.3.2 Recruitment and participants

Convenience sampling was used as a way to reach the greatest number of participants who met the selection criteria of clinicians within healthcare who had not received training in HCD. A gathering was being held with a group of individuals who had been elected into peer leadership roles within their unions who were referred to as shop stewards. Recruitment into the study was based solely on those nurses who attended the meeting, and each participant was in a staff nurse role at KP. This requirement was ensured by the union delegate coordinator who was stationed at the entrance to the room. A total of 225 nurses attended the two workshops. They were divided into two sessions, one in February and one in March 2015, as was standard for the meeting format (see Table 4.1). The participants' demographic data is not included in the research because the IRB stated that personally identifying information should not to be collected.

Table 4.1: Workshop demographics and participation

Session	Number of attendees	% female % male	% empathy maps completed and returned	Age range
February	105	72% female 18% male	64% (n=67)	29–64
March	121	79% female 11% male	52% (n=63)	32–61

To be included in the study, participants were required to attend the entire workshop. The two groups of nurses received the same content. Of the 226 nurses who participated in the workshop, 125 completed the required exercise and returned it to the researcher prior to departing. The other participant opted not to turn in their worksheets, which could cause a bias in the opinions expressed.

4.3.2.1 Workshop design

An empathy-mapping workshop was designed for the shop stewards in attendance. The following parameters were put into place for the workshop design due to the requests of the leadership team and/or the limitations of the existing space and participants:

- The participants were not designers, and thus, the instructions and tools needed to be easily understood and used by those new to the design field.
- One hour was allotted to this portion of the workshop.
- The exercise needed to be introduced and facilitated by one person (in this case the primary researcher) from the front of the room due to room set-up and audiovisual constraints.

The empathy map was selected as a tool that could both gather the needed information for the study and be easily learned and utilised by the nurses as a tool in the future. This practice-led approach optimised a pre-existing meeting to provide valuable data to the researcher and provide a common reusable tool for participants to repurpose (Nicolini, Gherardi, and Yanow 2003).

The empathy map is a design tool used to aid in the identification of a user's latent, or unknown, needs (Kelley and Kelley 2012; Vianna et al. 2012), who in this case were nurses conveying the conditions they needed to support their being champions of innovation and change. The knowledge acquired through the empathy map exercise helped to better understand the environmental needs that aid this behaviour being supported in a large organisation using design.

Five different versions of the empathy map were found online by the researcher, but the variations were noted as primarily aesthetic. The main categories were captured and found to be consistent and deemed the minimal sections to be completed during the activity (see Figure 4.1).

> Say: What are some quotes and defining words your user said?
> Do: What actions and behaviours did you notice?
> Think: What might your user be thinking? What does this tell you about his or her beliefs?
> Feel: What emotions might your subject be feeling?

Figure 4.1: Empathy map tool (Design Thinking Action Lab 2013)

4.3.2.2 Piloting of workshop

The approach was piloted with 45 participants through a separate workshop where the activity and questions were given. Data was not collected at this point, as the purpose was to test the facilitation of the exercise. Still, the pilot identified several issues, which were addressed and adjusted prior to the final workshop.

4.3.2.3 Workshop procedure

The workshop was held in San Dimas, California, at the United Nurses Associations of California/United Healthcare Workers (UNAC/UHW) headquarters during a regularly scheduled shop stewards' meeting.

Audio prompts and instructions were stated at each activity segment to keep the group focused and progressing at a similar pace. Participants were asked to pair up with a person sitting next to them, as they would be interviewing each other and completing the empathy map based on what they discovered about their partner during the workshop. The researcher walked around the room to gather observations and to listen in on conversations and discussions during these workshop participant exercises.

Two segments were added to the standard empathy map, which were intended to add additional insights. The request of participants in the additional two segments was to

1. note the three words they felt described being a champion of innovation and change;

2. capture the ratings they would give on a 1–5 scale of how their abilities to be a champion of innovation and change are perceived by

    a. themselves;

    b. family/friends;

    c. their manager; and

    d. their peers.

If any of the ratings were different among the four categories, they were asked to write a reflective note about why that may be the case.

They were instructed not to include their name or any other identifying information on the empathy map. Verbal instructions for the completion of the tool occurred with each group in person in real time. After the event, the researcher synthesised the artefacts and observational field notes gathered during the session.

4.4 Data collection and analysis

At the end of the workshop, the participants in the study demonstrated their consent by passing their anonymous empathy maps to the middle aisle where they were collected, as per the IRB protocol for a low-risk study. Those who chose not to participate were told they could keep or throw away their empathy maps.

The data was combined across participants, and general themes were extracted. Thematic analysis was used as a way to identify patterns in the nurses' responses (Clarke and Braun 2014). Data was collected through three different sources described in more detail in the following sections.

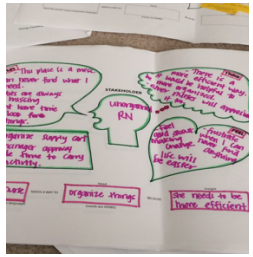
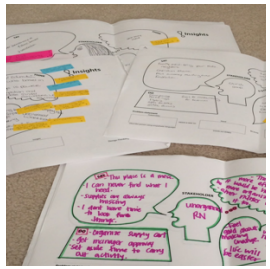
4.4.1 Textual analysis of the empathy map

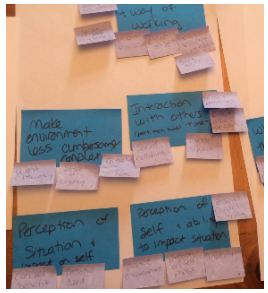
A total of 125 empathy maps ("maps") were gathered and reviewed. Three sections on the maps provided data for analysis. First, and the most detailed, was the map itself, which captured what each person was doing, saying, thinking, and feeling as a champion of innovation and change. This is where the majority of the time was given

for the exercise and provided the most detailed data for analysis; therefore, the majority of the results for this study are based on this segment.

The data synthesis began with an open coding of themes created by the researcher through sorting and resorting the data gathered from the maps. The map artefacts were combined across the maps, allowing patterns to be identified upon deeper analysis. To do this, words were extracted and colour coded based on enablers and detractors, followed by a further sorting of the data into additional themes. The themes were then refined and captured as distinct enablers. The approach is detailed in Table 4.2, demonstrating the synthesis of the empathy map exercise.

Table 4.2: Synthesis of empathy map exercise

	Analysis phases
	**Phase 1** • Read empathy map in its entirety for context and to complete the story captured. • Number maps for tracking purposes and to allow for an accurate count of the number of maps gathered. • Include a "p" in the numbering system if the story is personal as opposed to work related to provide additional context.
	Phase 2 • Look back at each element of the map and note specific written comments that seem to contribute positively or negatively to becoming a champion of innovation and change, the phenomenon under study, using coloured labelling.
	**Phase 3** • Write a short text segment on the appropriately coloured note and include the corresponding number/letter on the note to allow for tracking back to the original empathy map. • The numbering also provides the ability to see if the developing categories represent experiences from a range of people rather than from a few people or one individual.

	Analysis phases
	**Phase 4** • Remove the Post-its from all maps and place them onto another surface to begin reading and sorting them as a cumulative set in the most broad categories of positive and negative emotions as well as notable comments. • Read through all comments for high level patterns.
	**Phase 5** • Take the individual text segments and conduct multiple rounds of coding into organising themes and categories.
	**Phase 6** • Define and name themes that have been identified by taking apart and putting back together the data in new ways to aid in the identification of patterns, potential tensions, and early insights. • Pattern identification continued through multiple rounds of comparison of initial categories into theories and frameworks that emerged.

As noted here, the empathy maps were coded by hand using colour codes and Post-it notes. The small notes allowed for capturing key phrases and the ability to move and sort them easily until a thematic map of the analysis was complete.

4.4.2 Textual analysis of descriptor words

The next segment of the exercise captured the three words that described being a champion of innovation and change. These were captured during the workshop on each participant's map. The words that the participants used to describe a time they felt like a champion of innovation and change were entered into a spreadsheet, and a word count was generated. Based on this, the top five most frequently written words were captured.

Additional patterns were identified in the data by capturing the responses to the three questions and creating a visual representation of the word frequency (see Figure 4.2). Non-descriptive words such as "a", "the", "I", "so", and so on, were removed before creating the image called a "wordle" or "word cloud". The larger the word the more frequently it was used to describe what came to mind in being a champion of innovation and change and in answer to the self-reflection question about their image of themselves in this role versus others' images of them.

4.4.3 Analysis of perceptions

In the final exercise segment, the nurses were asked to rate their perceptions and others' perceptions of them regarding their ability to be a champion of innovation and change. They were then asked to capture self-reflections on any differences.

The perceptions of nurses' innovativeness were completed by approximately 30% of both groups due to time constraints. Therefore, only the high-level results of this segment were used for the analysis. To do this, all results of how participants rated themselves as a champion of innovation and change and how they believed the three other groups viewed them were captured and ranked from the most positive view to the least positive view.

4.5 Results

The results outline the personal descriptors, perceptions of self and others' perceptions, and the four main categories from the empathy map of seeing, doing, thinking, and feeling.

4.5.1 Descriptor words for being a champion of innovation and change

All words captured by participants on the journey maps were placed into a word cloud to illustrate the findings (see Figure 4.2). A word cloud online application (www.wordle.net)

was used by entering the data into a form; the application uses an algorithm to generate an image based on the frequency of the words. The more frequently the word is used the larger it is visualised. The placement and colours of the words are randomly generated by the programme and are solely aesthetic in nature.

The top five most frequently used adjectives that came to mind for the participants when thinking about being a champion of innovation and change (see Figure 4.2) are:

- Creative
- Accomplished
- Happy
- Proud
- Empowered

The word cloud generated from the participants' comments is shown in Figure 4.2, with the top five descriptors by frequency circled. Other words were found in the text but to a lesser degree. Some additional words were frequently mentioned, such as people, ideas, or manager, but they were not the descriptor words being sought. They were the words that provided the context, for example, "When people recognise my hard work and ideas, I feel really proud". In this example, proud is the descriptor word and the other words provide the context of when that emotion occurs.

Figure 4.2: Word frequency representation

Figure 4.2 shows that positive sentiments about creativity and happiness, and most notably the words proud, empowered, and accomplished, indicate a sense of confidence and control over one's actions. These results reveal that successfully leading an endeavour requiring innovation and change could have virtuous results for the individual that could increase confidence to attempt another challenge in the future.

4.5.2 Own versus others' perceptions

Participants were asked how they viewed themselves compared to how others viewed their level of creativity and innovation. It was found that the majority of the time, the nurses believed that others, particularly their managers, view them in a less positive light than they view themselves. If put in order, the nurses had a higher personal image of their own innovativeness, closely followed by friends and family, then the nurses' peers. They believed their manager views them as the least creative and innovative.

4.5.3 Primary empathy map: doing, saying, thinking, and feeling

The participants were asked to identify experiences in which they felt like a “champion of innovation and change”. Through this exercise, a core group of enablers were identified. While the question posed to the participants asked only for enablers, approximately 15% of the comments captured contained context around topics that were detractors of their efforts to be a champion of innovation and change. The detractors are discussed first, followed by a description of the identified enablers.

4.5.3.1 Detractors

The detractors that kept them from the “feeling” and “doing” actions were primarily about fear in social groups. The most often-mentioned comment was the fear of how colleagues and peers would react to their ideas and experiments. This fear was not limited to work situations; it also extended to their personal lives where people were afraid to speak in front of others, typically in community or volunteer work, in case of being judged. The belief that managers see innovators and change makers as “troublemakers” was also a prevalent theme*. “What will they think of me”* was a common phrase, with a particular worry focused around how their peers and manager would respond.

4.5.3.2 Enablers

The components that helped to enable being a champion of innovation and change came from a much more varied set of comments: environmental factors, factors that impacted or were impacted by control over resources, new knowledge creation, social collaboration, ability to see and share the impact, sense of purpose and helping others, the speed by which ideas could be created and tested, the personal need for a solution, and finally, the ultimate positive impact it had on their self-image and confidence. (See Table 4.3 for a summary of enablers.)

Over half the items included conditions that were seen as personally affecting the individual. A common phrase was *“I really need to learn how to fix this; it’s driving me crazy!”* Respondents stated that they are motivated by being able to conduct a test or experiment and see its value very quickly. More immediate feedback is of importance, specifically when trying to ascertain whether a solution works or whether they should attempt to influence others to participate in the change.

Participants described the action-oriented approach they take that helps them to become a champion of innovation and change. Their active approach included repeated testing and experimentation with end users. Even given the resource-constrained environment they often work within, they found that solutions sometimes grow from a low level of resource scarcity or novel idea pairings by forcing creative problem solving. Positive encouragement from others, especially when the others can see and experience the solution, resulted in a sense of accomplishment. With this accomplishment, either big or small, the individual's self-image was described as shifting from that of self-doubt and fear to a more positive self-image, with the commonly repeated phrase *"I now know I can do it".*

Table 4.3 summarises the elements that the participants recognised as enablers. They are broken into the most frequent theme per the thematic analysis, with the inclusion of references that support the same theme in the literature.

Table 4.3: Enablers for non-designers championing innovation and change

Enabler	Rationale	Supported by the literature
Personal need for a solution	Participants looked for curiosity and learning, social time with people they liked, and had a desire to "fix" something that was not currently working in their personal or work environment.	Tucker and Edmondson 2003
Challenges that have meaningful purpose	Participants looked for and recalled efforts they believed had meaning to them. The desire to help others was a strong motivator for the participants, as well as a personal purpose and passion for the challenge at hand.	Amabile and Pratt 2016, Bandura 1989, 1994
Clarity of goal and control of resources	The goal to be accomplished was clear, and there was a high ability to control the resources including one of more of the following: money, people, or time allotted.	Amabile and Pratt 2016, Tucker and Edmondson 2003

Enabler	Rationale	Supported by the literature
Experiencing progress quickly and visibly	Rapid and positive feedback was of importance to gain confidence and create momentum to continue the work.	Amabile and Pratt 2016, Bandura 1989, 1994, Fogg 2009, Kotter 1995
Active experimentation	Action-oriented approaches helped to hone what worked for the situation and enhance process innovativeness.	Baer and Frese 2003
Positive encouragement and confidence	Positive encouragement from others resulted in a sense of accomplishment and belief that success was possible.	Murry 2015
Provision of psychological safety	The need to feel free of fear about how colleagues and peers will react to their ideas and experiments, and to feel that the manager does not see innovators as troublemakers, was important.	Amabile and Pratt 2016, Edmondson 2002, Edmondson and Lei 2014

The empathy map provided a large volume of data from which the enabling conditions for innovation and change could be drawn.

Through analysis, seven enablers of being a champion of innovation and change were identified. Quotes from the participating nurses were also taken from the empathy maps to provide context for this qualitative ethnographic approach which will follow each listed enabler (Savin-Badin and Major 2013).

1. **A personal need for a solution.** The analysis indicates that nurses are enabled when they feel a personal need for the solution and did not mention their engagement for solutions seen as important solely to meet "organisational" needs. Feeding participants' curiosity and learning, providing social time with people they liked, and eliciting a desire to "fix" something that

is not currently working in their personal or work environment encourages them to be creative and innovate.

> I can't waste any time on hunting for the things I need. It's so frustrating to me. [Personal friend/colleague] agrees. We'll work on it together. It makes it more fun.

2. **Challenges that have meaningful purpose.** Participants looked for and recalled innovation efforts that had meaning to them. The desire to help others is a strong motivator to innovate for the participants, as is a felt purpose and passion for the challenge at hand.

> My sister had the same [illness] and we nearly lost her. I want to be able to help other families through it.

3. **Clarity of goal and control of resources.** The innovation goal to be accomplished needs to be clear, and individuals indicated they are facilitated by the ability to control at least a portion of the resources needed to help find solutions associated with a challenge, including, for example, money, the people involved, or the time allotted. There also appears to be a point at which the resources are enough but not overly available, as novel solutions sometimes grow from a modest level of resource scarcity.

> Our little team only had three days to figure it out and a [defined amount] of supplies available, but I knew what we needed to accomplish, just not how to do it. We had to be really clever about using [what we had]. I was saying 'put this here, bring me back this information, go find [another needed resource]', and in the end, it all worked.

4. **Active experimentation.** With access to the needed resources and a motivation to find a solution, the next enabler described was applying those resources towards testing out possible solutions. This active experimentation is hands-on and action oriented. Effectiveness of experimentation is felt to be linked to repeated testing of ideas, meaning the more someone experiments the better they become at the activity.

I changed [a potential solution] five times. It still wasn't right. But by the sixth time I tried an idea, that was it. I finally nailed how to make [the prototype needed] and I'll do it again!

5. **Experiencing progress quickly and visibly**. The ability to feel a sense of forward progress was identified as important. Progress is displayed in a variety of ways, including clarifying goals, gathering the needed resources, and quickly trying out ideas. The participants often mentioned that "seeing" the progress resonates more with them than just being told progress is being made; additionally, it is important to see it happen quickly.

   A week later I looked down the hallway and there it was, my [colleagues] were actually doing [the new idea]. It was happening and I could see it. It wasn't perfect, but it was progress.

6. **Positive encouragement and confidence.** Participants seeking to innovate indicated that positive encouragement from others around them is important, particularly during difficult endeavours. Positive feedback was found to be important to help identify whether a change or a solution is working. This feedback is also important to increase their confidence, and the public encouragement serves as a tool to influence others to participate in the solution/change.

   I was nominated to serve on the committee because of my past work. [They] listed off a number of things I'd taken on and celebrated it. I felt so proud. After that it was easy for me to pull together a team [to tackle new problems].

7. **The provision of psychological safety.** It was found that participants are fearful of how colleagues and peers will react to their ideas and experiments, and they worry about being judged negatively. They also felt that management may see innovators as troublemakers. To this end, they ranked their managers as having the lowest perception of their ability to champion innovation and change when compared to their peers, friends, family, and their perceptions of their own abilities. Therefore, environment and culture that encourages a feeling of safety around innovation is deemed important.

> I worry so much that [my team] will hate my ideas. So most of the time I just stay quiet. It seems better that way and it doesn't rock the boat. It's just not encouraged around here.

The enablers identified were also contained within the literature; however, not one specific study identified them together. Thus, this research sheds new light on the topic when viewed as a whole.

4.6 Discussion

As stated, various components identified in this study are supported in the literature, which also adds to their validity (Savin-Badin and Major 2013). However, viewing them as a whole and in this unique context of organisational healthcare workers adds a more comprehensive view of enabling conditions to help champions of innovation and change succeed.

4.6.1 Descriptors and own versus others' perceptions

The positive emotions associated with being a champion of innovation and change should be considered as a motivator for those who have experienced the desired outcome. These experiences have the potential to create more momentum for people who have felt successful, leading to more efforts to lead further innovation. This positive force is potentially countered by psychological safety factors relating to others. The perceived level of risk involved in trying ideas and the potential judgement from peers and managers is worth considering when the environments for learning are being selected (Edmondson and Lei 2014; Edmondson and Moingeon 1998). Innovation within organisational enterprises is inherently complex, and so providing clarity and control where possible is important (Amabile and Pratt 2016). Clear goals and adequate resources are areas that could positively affect the individual's ability to innovate (Amabile and Pratt 2016), and therefore, organisational enterprises should critically review their ability to provide the infrastructure that would enable these identified needs.

4.6.2 Enablers

This study has identified specific enablers for nurses seeking to champion innovation and change. While innovation within a healthcare workforce has been noted as critical for the transformation needed, little has been written about how to enable this for widespread

innovation (Länsisalmi et al. 2006). Individual enablers were identified, which are perceived to create the conditions that aid in innovation and change. Each enabler is stated below and discussed with additional context.

4.6.2.1 Personal need for a solution

The study found that the nurses are more likely to engage in innovation if they believe there is a personal need for a solution and it addresses their day-to-day hassles that are perceived to be irritants or barriers to a better work environment. This is in alignment with the research on first order problem solving in healthcare, particularly within the nursing profession (Tucker and Edmondson 2003). With this type of problem solving, underlying causes are not addressed but a short-term fix is used, which provides a faster sense of satisfaction to the problem solver than a deeper second-order or root-cause approach creates. The positive emotions experienced in rapidly solving a personal need is also connected with the next enabler, meaningful purpose, the difference being that solutions that solve a personal need may or may not positively impact others. The main intent of personal solutions is that they are seen as personally valuable or helpful to the person trying to solve a problem.

4.6.2.2 Challenges that have meaningful purpose

Meaningful work is defined as work that is viewed not only as a help to oneself, but also to help others in a more altruistic way (Amabile and Pratt 2016), as is the case here. Making progress towards a work effort alone has been found ineffective in keeping people engaged at work. The progress made also needs to be tied to an effort viewed as meaningful by the change agent working towards it (Amabile and Pratt 2016; Bate, Bevan, and Robert 2004). Meaning and purpose are particular areas of importance that are missing in the innovation leadership characteristics identified by Weberg (2013). The focus of Weberg's work were leadership characteristics of innovation, it is notable that these are all external-facing behaviours, such as coordination of information flow, visioning, and risk taking, and none of them capture elements that would be considered in line with intrinsic motivation. This raises the question of whether these are missing because experts or leaders in a field are motivated to take on significant challenges solely for the challenge, or whether that element was overlooked in Weberg's research.

4.6.2.3 Clarity of goal and control of resources

Participants described feeling more empowered and able to make change when they feel there is clarity about the goals and resources they have to apply to the potential change. The resources do not need to be ample; the important factor seems to be that they are adequate, clear, and available. This availability includes having control over how and when to use the resources. Clear goals are stated as a key catalyst that leads to a feeling of progression, which in turn leads to more engagement in the workforce for future innovation work (Amabile and Pratt 2016).

4.6.2.4 Experiencing progress quickly and visibly

Being able to make changes quickly is related to clarity of goals and control of resources for the individuals participating. The participants stated that a clear goal helps them to know what is considered progress in spite of confusing situations, and that they feel they can make progress if they can control resources and timing when they are trying to move towards the goal. Planning for and creating distinct short-term wins is stated as one of the eight steps to transforming an organisation (Kotter 1995). Fogg's (2009) behaviour change research emphasised the importance of quick and easy "wins". He stated that the ability to achieve something easily and quickly creates the state for further progress towards the desired behaviour, even more strongly than the factor of motivation (Fogg 2009). However, in his work on self-efficacy, Bandura (1989, 1994) disagreed, stating the overriding importance of motivation.

In a diary study of 238 professionals, the single most prominent event that occurred in people's workdays, correlated with a positive subjective experience, was making progress in meaningful work (Amabile and Pratt 2016). The reason is that even when individuals experience progress at work, the level of meaning tied to the work propels their engagement and creativity. This study echoes the importance of this element of progress and emphasises the need for it to occur rapidly and in a way that the nurses can experience.

4.6.2.5 Active experimentation

It seems that the conditions of clarity of goal, psychological safety, and resource support need to be in place for actions to occur. When these factors are in place, the participants

described that the result is an active experimentation of ideas. They discussed the excitement of trying out possible solutions iteratively, quickly, and cheaply. This experimentation, the refinement and testing of ideas, is a way to bring other people along in the change and learning process (Edmondson 2002). Murray and Ma (2010: 12) stated that this is "because it's through iteration, and trial and error, that coalitions gather strength and conflicts are resolved".

So while this active experimentation approach has a positive effect on the participants as individuals, it could also have the effect of creating supportive "coalitions" to help with the experimentation and learning within the organisational environment.

4.6.2.6 Positive encouragement and confidence

The experience of conducting an experiment or trial that has a quick and positive outcome creates motivation to continue testing changes, spreading the momentum and a willingness to try additional ideas next time to others (Amabile and Pratt 2016; Lin et al. 2011). This is considered a virtuous cycle and leads the individual to undertake additional experiments or tests in the future. The individual narrative of *"I can't believe I did it"* was often followed by *"I can't wait to do it again"* in the empathy map exercise. This reinforcement builds on intrinsic motivation linked back to the "visible results", as it offers people a chance to see and experience the impact of their efforts and their feeling of individual progress (Amabile and Pratt 2016). In other words, work efforts seen as positive yield positive encouragement from others, yield positive feelings of self-confidence, and this yields a desire to take on more work efforts.

4.6.2.7 Provision of psychological safety

The empathy map exercise asked participants specifically for reflections on past experiences that enabled them to be a champion of innovation and change; however, a minority of participants still included examples that detracted them. The main finding is the impact of fear of others' responses to their behaviour. This finding aligns with the work of Edmondson on what she termed "psychological safety" (Edmondson 2002; Edmondson and Lei 2014). Individuals in an environment where there is a low level of trust among peers and management subsequently feel that their capability is in question and feel that they are more likely to be judged. Because of this, people keep their opinions to

themselves for fear of harming their reputation and losing respect (Edmondson 2002; Edmondson and Lei 2014).

Although individuals rated their manager's perception of their ability to be a champion of innovation below all other groups, the group from which they feel the most fear of judgement and criticism was noted as their peers. They believe their managers have a poorer perception of them, but in terms of bad judgement, they are more concerned with their peers. Being judged poorly by their peers concerns them more than being judged poorly by their managers. This finding links back to the importance of positive feedback from others and places a high value on feedback from peers.

Although rare, it has been found that where there is a high degree of psychological safety in a team, people are not fearful of making mistakes if they are supported through failure by their leadership, who view failure as a way to learn (Amabile and Pratt 2016). This demonstrates the connection between the environment set by leadership and the fear of making mistakes. Amabile and Pratt's research (2016) found that failures can create additional intrinsic motivation and reengagement in the creative process towards organisational innovations under these conditions. So to frame this finding in a positive light, psychological safety allows individuals to take more risks and recover from setbacks so they can continue on their path to develop innovations.

4.7 Implications for leading enterprise innovation

The findings of this study have begun to validate previous studies in areas such as psychological safety (Edmondson 2002; Edmondson and Lei 2014) and to emphasise the need to consider workplace design and innovation capability building through a known but unleveraged view of the learner framework (Kimmel et al. 1998) to take on new valuable behaviours, such as rapid experimentation. Additionally, this work potentially uncovers a gap in the research around innovation leadership characteristics (Weberg 2013). It suggests a new lens through which to view the individual learner in a high-risk environment of innovation (Baer and Frese 2003) by studying the application of design methods as a way to approach behaviour change, which is needed to learn to test and experiment using innovative solutions (Fogg 2009; Michie et al. 2008; Michie, van Stralen, and West 2011).

4.8 Study limitations and opportunities for future research

The prioritisation of the enablers, or whether or not there is a hierarchical order to the enablers, may warrant further study. It is reasonable to believe that the enablers discovered are not of equal priority, nor are they likely to occur simultaneously. Additionally, some enablers may have a stronger influence on the individual and the environment than others may. To better understand this, further context and narratives would need to be collected from the participants through observations, individual interviews, or a rating tool.

The participants in this study had not yet learned HCD; therefore, more research is needed for learners who actively attempt to learn and apply methods for innovation to continue to understand the learner's journey beyond the needed conditions for innovation and change. The design of this study of nurses did not allow for a detailed description of participants' experiences (Yin 2013). A future study would provide for a more in-depth description of the individuals' learning and applying HCD methods within an organisational context, which goes beyond the needs identified in this study but would provide more context and narrative surrounding the nurses.

The empathy map provided a tool that could be completed directly by the participants, allowing for the collection of a larger sample than the 1:1 data collection approaches used by the researcher, such as direct interviewing. The categories of "hear" and "see" provided context to the narrative, and the "think" and "feel" categories prompted the capture of data beyond the situation itself. It captured latent needs that are personal in nature, such as the deep sense of purpose as a motivator, the fear of trying ideas in front of others, the excitement of achieving a goal, and the frustration of not knowing how to obtain the needed resources. However, a limitation of the empathy map is the inability of participants to easily draw "insight" from the narratives. This is evidenced by the insight section remaining incomplete on 82% of empathy maps returned for analysis. The large size of the audience, timeframe constraints, and the fact that none of the participants had used the tool before provide a hypothesis for the limitation. Time had not been allotted to "teach" what an insight is and how to generate one.

For individuals engaged in a learning journey to use design methods towards innovation challenges, trying them out and gaining confidence in the methods in an environment

perceived as lower risk would be more productive than immediately trying them out in a high-risk work or personal setting. To be more specific, there is less fear of failure in a setting in which you already feel empowered, creative, and accomplished (Edmondson and Lei 2014). Ways to create this environment within a larger organisational culture are needed, and these are looked at more closely in the cross-industry study of exemplars in Chapter 5.

Perhaps new learners need more of a sense of purpose and intrinsic motivation to take on a large challenge, whereas experts/leaders in a field are more motivated by the process of addressing the challenge itself. If these phenomena are viewed as a learning journey, the new learner and the expert learning journeys may also have different drivers and influencers (Weberg 2013; Kimmel et al. 1998). Setting up the appropriate resources to support the efforts, environments for rapid testing, and positive encouragement need to be considered when looking at where individuals may best develop as champions of innovation and change (Amabile and Pratt 2016). Therefore, identifying these environments and understanding how to develop them are of importance. Individual journeys of people learning and applying HCD and the people who help to teach them are studied further in the yearlong longitudinal study of the Innovation Catalyst programme in Chapter 6.

4.9 Chapter conclusion

This study aimed to understand the conditions that are needed to champion innovation and change by individuals who are untrained in HCD. In this case, the individuals were nurses, the primary workforce in healthcare. A workshop-based approach was employed, using an empathy map exercise and a set of questions for additional data collection.

From the empathy map exercise, seven key enabling conditions to champion innovation and change from the nurses' viewpoints were identified, including

- having a personal need for the solution itself;
- focusing on challenges that have a meaningful purpose;
- clarity of goals and control of available resources;

- ability to actively experiment with possible solutions;
- experiencing progress quickly and visibly;
- positive encouragement and the resulting development of confidence;
- psychological safety as an enabler to counter fear.

Additionally, this study reveals two other potential influencers that could affect this population's efforts to champion innovation and change. First, it surfaces a gap between how nurses see themselves as innovators and how they believe others perceive them. It indicates that the view nurses have of themselves is more positive than that they believe is held by their peers, family, and friends, with the largest gap being between their view of themselves and how they believe their managers view them. Still, the group that they fear making mistakes in front of the most are their peers, which could have implications for their willingness to lead innovation and change at work. Second, the study highlights key words that demonstrate the positive emotions nurses feel when they take actions that make them feel like champions of innovation and change. Emotions such as happy, creative, empowered, accomplished, and proud could lead to increased confidence or willingness to attempt future efforts.

Having explored the perspectives of novice learners, Chapter 5 explores the experiences of a group of individuals with considerably more exposure to HCD. These cross-industry exemplars are referred to as "change agents" and are individuals well known for successfully bringing HCD into a large organisation and applying it to innovation challenges. Through this study, Chapter 5 begins to build a more comprehensive picture of the other end of the spectrum of exposure and expertise in HCD and innovation, placing it in an organisational context. These experiences and approaches aid in creating a basis for a common understanding of those who have been successful in their endeavours, thereby guiding others who seek to develop HCD for innovation within an organisational workforce.

Chapter 5: Cross-industry study of exemplars' perspectives of developing HCD within the workforce

5.1 Introduction

Research on creativity and innovation shows a lack of understanding of the psychological factors involved in the work context (Amabile and Pratt 2016), which suggests a deeper reflective narrative could help elaborate upon the experiences held by those recognised as successful experts in the area (Creswell 1998). This chapter therefore explores the real-world experiences of individual exemplars/change agents who have successfully applied HCD in their work organisation over a number of years.

The importance of individual capacity for innovation has been stated as a driver and key need in healthcare innovation (Berwick 2003; Cresswell, Cunningham-Burley, and Sheikh 2017). The role of the individual in change was the focus of this study. Learning and application of new organisational capabilities begin at an individual level and can eventually grow to support organisational structures and become more dynamic innovation capabilities (Rothaermel and Hess 2007). Healthcare organisations are resistant to changes in practices (Shortell et al. 2015) and thus, development of dynamic innovation capabilities remains difficult and can be counter to the pervasive organisational culture. With this in mind, the "dark side of innovation" or the "stress" faced by change agents attempting to question existing practices and introduce new ones (Länsisalmi 2006) remains relatively understudied (Anderson, Potocnik, and Zhou 2014). If the change agents creating innovations through design are not adequately supported, they may give up or leave the organisation (Länsisalmi 2006). This research sought to understand the experiences of those who have overcome these challenges so that others can learn from their successes. It aimed to guide the development of a model of components that successful change agents have put in place to practice HCD within their organisations, thereby guiding others who seek to develop a HCD practice for innovation within their own organisation.

5.1.1 Aims and objectives

The aim of this study was to explore the experiences of successful change agents in learning and applying HCD within large organisations to inform the development of a model of key components for HCD implementation by others.

The specific objectives were to

- explore change agents' experiences in learning and applying HCD methods;
- identify common patterns among change agents' experiences;
- develop a model of components to drive successful implementation of HCD.

5.2 Method

This study was approved by the KP IRB panel and the Coventry University Ethics Review Committee. All participants provided their consent prior to participation in the study.

5.2.1 Study design

The overall approach was a qualitative ethnographic approach which included interviewing participants using semi-structured interview questions and utilizing design-based journey map tools. Approximately half the change agent interviewees were not formally trained as designers and learned the methods in their own workplaces. The way in which individuals reflect on history lends insight to their actions in both the present and in the future, and thus, the operating schema of individuals is shaped by their history (Stacey 2007). Interviewing those individuals positioned as leaders in the field of HCD within organisations provided an "extreme" user view to the analysis of individual experiences in learning and applying HCD.

To help shape the direction of the interview questions, initial discussions were held with individual thought leaders who worked across industries as consultants and academic researchers in HCD.

5.2.1.1 Discussions with thought leaders

Thought leaders for this study were defined as leaders who had worked across industries in a consulting or academic capacity in the field of design. Brief scoping interviews were undertaken with these thought leaders to gain a broad overview of the current state and changes in the field from their perspectives. This provided further insight into the area based on their breadth of experience across settings and industries. These high-level insights subsequently shaped the interview questions asked of the change agents.

Nine individuals who had broad access to business and academic trends in the field of design and innovation took part in the thought leader discussions. The discussions were held over the phone, or in person based on the availability of the interviewees, and lasted between 30 and 60 minutes. Detailed notes were taken of each conversation. Due to their "outsider" viewpoints of business through their consulting, academic teaching, or board appointment, they were perceived to have a more objective viewpoint about how organisations approach the development of design capabilities in their environment. Details about their demographics are summarised in Appendix 2, Thought Leader Demographics.

The discussions included a common two-part question: (a) When you reflect on organisations who are building capacity to use HCD, what do you see occur? and (b) What seems to have changed over time? These questions generated discussion about their experiences across many industries and the ways organisational leadership approaches the act of learning and applying HCD internally. The participants shared that some organisations seem to have pockets of HCD that have been developed and sustained over time, but this change was not universal across all organisations. Four themes emerged, which were then used to generate the organizational change agent interview questions. The themes were:

- **Risk avoidance:** Organisational employees are inadvertently incentivised to evade risk in order to avoid being seen as a "problem" or a "troublemaker", or to "stay under the radar" during organisational change. Some organisations seem to have departments or smaller internal entities that behave differently, but as a whole, organisations remain risk averse.

- **Contract vs develop "creatives":** Leadership is often uninformed about its own talent's needs, abilities, or limitations. They are sometimes overly confident about how "easy" it will be for their own workforce, and then they observe failed efforts. This leads them to believe that they lack the "right people" or the "right leadership" to do the creative work for innovation and this leaves employees feeling disappointed. Consultants and contractors may be brought in as they are perceived as a faster and easier solution.

- **Organisational attention span:** There is a short "organisational attention span", meaning that the level of patience to develop the employee capacity for innovation and HCD skills and to measure the value of design and innovation is very low, and the focused effort provided to do the work does not last very long or occur in the first place. As more information is available, informed organisations adjust their expectations about what is needed and allow a longer timeframe and support for capability building, but this is not consistent across all organisations.

- **Feeling, framing, and trying:** Organisations as a whole want to move fast and are challenged in three key areas of design: focusing on people's latent needs, reframing the problem, and rapid experimentation to try out ideas and learn from the experiments. These are core tenets of HCD and take time to develop as fundamental skills.

5.2.1.2 Interview question development and piloting

The thought leader themes guided the development of the semi-structured interview questions that were asked of the change agents. The change agent interview questions and journey-mapping exercise were piloted by two participants to estimate the interview length and to ensure the questions would generate applicable insights.

Based on the pilot, an additional two questions were added to create a shared understanding of key terms in the interview, specifically "innovation" and "human-centred design" (Britten 1995). A further question was added to provide context about the interviewees' work role within their organisation. It was also decided to provide a copy of the interview questions prior to and during the interview to allow advanced consideration of

the questions by the interviewees. Table 5.1 summarises the resulting questions and maps them to the thought leader themes.

Table 5.1: Thought leader interview themes mapped to change agent interview questions

Thought leader themes	Interview questions
Post-pilot addition—provides context and clarity	1. When you talk about innovation, how do you describe it? When you talk about design, how do you describe it? How do innovation and design play a part in your current role?
Development of creatives: feeling, framing, and trying	2. This is where I'd like to spend most of my time with you. Would you start at the beginning and tell me about the human-centred design and innovation programmes and activities you have been a part of? What did you participate in, why did you choose that, and what did you get out of it? (If in person, draw it out; if remote, draw it out on a timeline, take a photo of it, and send it to me.)
Development of creatives	3. When you look at that journey, what do you think? What do you reflect on? 4. What has caused you to put this much time into this particular work? Can you also tell me about some specific experiences that stand out for you?
Organisational attention span; development of creatives: risk avoidance	5. Were there times you wanted to quit doing this type of work? 6. Could you tell me more about it?
Development of creatives: feeling, framing, and trying	7. What do you love about it?
Development of creatives: risk	8. When you think about the people who try to do this type of work in this organisation, do you see any differences in the people who grow into it and it seems "to work" for them versus those who don't

avoidance, feeling, framing, and trying		"get it" or just stop doing it all together? Could you tell me about the differences or possible causes that you've noticed?
Organisational attention span; development of creatives: risk avoidance, feeling, framing, and trying	9.	If you were to give advice to people in other organisations who want to learn and apply these types of methods, what advice would you give them?
Organisational attention span	10.	What have your organisation's experiences been like over time? What has kept your organisation on this path up to this point? Do any moments or experiences stand out to you that could impact the experiences of the individuals learning and applying these methods?
Organisational attention span: feeling, framing, and trying	11.	In your interactions with other industries, have you noticed any differences in the receptivity to innovation? How about to human-centred design?
Closing question	12.	Since I am trying to learn how to create approaches and conditions that help people use human-centred design as a way to enhance their own innovation ability, are there other things that I should know or think about that we haven't discussed?

5.2.2 Organisational change agent interviews

As detailed at the start of this chapter, the interviews with change agents aimed to gain an in-depth personal experience in design and innovation from the viewpoint of a practitioner in a large organisation leading and introducing the organisation to the practice of HCD. The interviews also included a journey-mapping exercise to gain a deeper understanding of their personal efforts and experiences as a practitioner in design and innovation in these environments over time.

5.2.2.1 Recruitment

Judgement sampling was used to identify the change agents. This approach yielded a small sample of healthcare organisations; to maintain the reliability of the study through an adequate sample size (Creswell 1998; Creswell and Miller 2000), it was determined to include organisations outside the healthcare sector. These individuals included those asked to speak as experts on the topic of bringing HCD into organisations at design conferences, such as the DMI, UX Week, and HCD by Marcus Evans.

The following inclusion/exclusion criteria were applied to confirm the final participants to be contacted:

- Employed by large organisations (over 8,000 employees);
- Sustained the use of methods for over five years if a non-government organisation and over two years if a government organisation, as government organisations were earlier on the adoption curve and had only a few years of experience;
- Demonstrated attempts to teach skills to internal employees, as opposed to relying solely on external consultant support for methods;
- Viewed as a leader in this area as evidenced by recognition from peers and acknowledgement in press and/or research;
- Self-identified in the popular press and through research articles that their employees used HCD methods within their organisation.

Two informal networks and two formal councils were used as additional data points to identify participants. The councils were The Conference Board's Innovation Council and the University of California Berkeley Roundtable on Applied Innovation and Design. Attention was given to a diversity of sectors, with priority given to "service" industries to provide a similar comparison to healthcare. Firms were prioritised by those that had operational units and available contacts in the US to allow for in-person interviewing when possible. Additionally, diversity was considered in both gender and age.

Fifteen participants took part (seven male, seven female). All individuals contacted agreed to participate, but one was not included due to difficulty in scheduling. After seven individuals had been interviewed, the categories began to repeat themselves, and thus, no additional interviews were sought beyond the 15 that were scheduled. This met the criteria of participation for a robust qualitative interview and data saturation (Yin 2013). The participants' characteristics are detailed in Table 5.2.

Table 5.2: Change agent demographics

Organisational information		**Participant information**			
Company size and sector	**Year HCD application began**	**Role**	**Age**	**Gender**	**Years experienced in HCD**
Nordstrom					
67,000 Retail	2006	Director	35–44	M	6
Kaiser Permanente					
190,000 Healthcare	2003	Specialist Director Manager	35–44 35–44 25–34	M M F	6 12 3
Proctor and Gamble					
121,000 Consumer products	2004	Director Director	45–54 55–64	M F	14 13
US Department of Labor					
18,000 Government	2010	Director	55–64	F	2

Intuit					
8,200 Software	2006	Director Director	35–44 35–44 25–34	F F M	10 8 10
Fidelity					
41,000 Financial	2009	Director Director	35–44 35–44	F M	5 18
National Health Service					
1.6 million Healthcare	2005	Executive	45–54	F	11
US Department of Health and Human Services					
79,540 Government	2011	Executive	55–64	M	2
The Gap					
137,000 Retail	2009	Executive	55-64	M	15

5.2.2.2 Procedure

Interviews took place between February and September 2015. Each interview lasted between 45 and 90 minutes, and they were conducted by the same researcher, the author, who had more than 12 years of experience in conducting similar interviews for design research. Every attempt was made to conduct the interviews in person, and ultimately, 50% were conducted this way. They occurred in a variety of settings for the convenience of the interviewee; for half the participants, this occurred in their workspace, with the other half taking place at off-site locations in settings such as conferences or meetings. For those interviews not conducted in person because of cost limitations or interviewee availability, remote video technology was used. This attempted to support the visual nature of an ethnographic approach and also allowed for two-way sharing of images and artefacts when needed. In the end, both interview formats allowed the researcher to visually note

social cues, body language specifically, which are important elements in qualitative interviews (Opdenakker 2006).

The interviews included 12 semi-structured questions and a journey-mapping exercise. The journey map was selected as an additional interview tool to allow the interviewees to express their experiences and emotions over time. It is a commonly used tool in design to support deep user storytelling and to provide context (Hanington 2003; Hanington and Martin 2012) and it is believed to aid the researcher in challenging commonly held bias (Liedtka 2015).

After gaining consent from the participants, the interviewer worked through the 12 questions. Question 4 (see Table 5.1 for specifics) asked for a description of the journey map, with emotional high and low points and changes over time. Large format sheets were placed on the wall in the interview room in advance when possible. The interview participants were then asked to draw on the paper to visually represent their journey for the first 15 minutes of the interview. Once completed, the participants were asked to explain what they had captured.

The journey map content was used as a tool for deeper questioning during the interview to clarify comments, note inconsistencies or changes, and in some cases to expand into new subject areas. An example is provided in Figures 5.1 and 5.2.

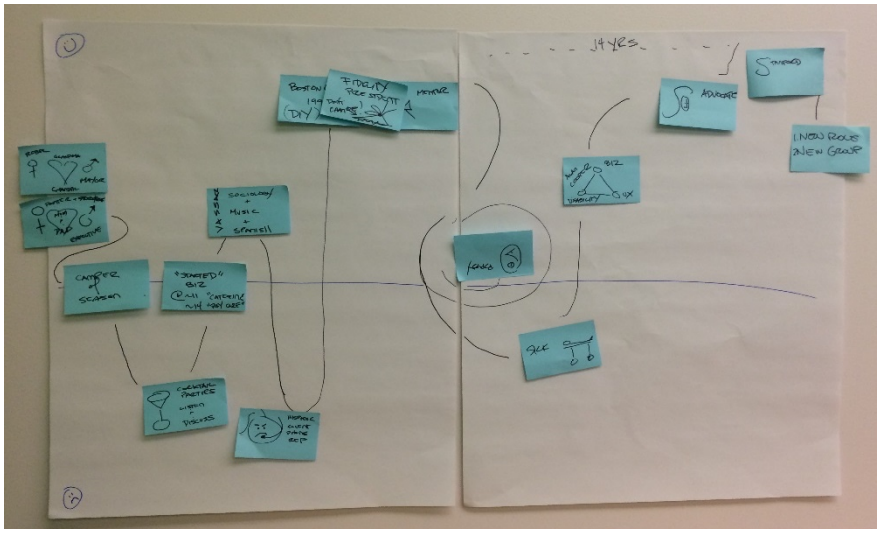


Figure 5.1: Example journey map generated through the interviews

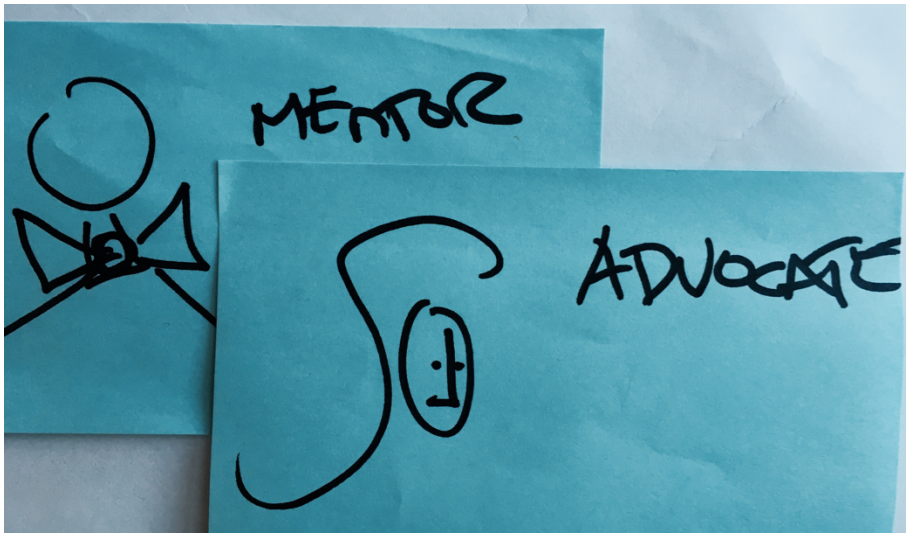


Figure 5.2: Close-up of two topics, "mentor" and "advocate", from journey map activity

5.2.3 Data collection and analysis

Thematic analysis was used to analyse the interview data collected and the artefacts created through the journey map exercise (Braun and Clarke 2006). Attention was paid to potential themes that occurred across multiple interviewees and industries. Topics that were mentioned by the interviewees many times in the course of the same interview, as well as comments that were made in a tone or with emotion that was markedly different from the majority of the interview, were also noted.

Double coding was undertaken by an executive within KP to verify the emerging themes. The executive had been exposed to project efforts that used the design methods and was interested in identifying an approach for his department to develop the capabilities for their work efforts. He independently reviewed three blinded transcripts of change agents from three different organisations. There was consistent coding of themes.

Of particular interest in the analysis was contradiction in people's stories. The contradictions were identified within each coded transcript and then compared across interviews. Information about their own practice was pieced together through discussions in the interview, and often, more in-depth discussions were triggered by the journey map. Contradictions in people's stories can yield interesting insights into how people think (Beckman and Barry 2009). Additionally, "cognitive bias", or a flaw in the cognitive

processing of an individual, can limit one's ability to think and solve problems creatively. With a certain type of cognitive bias called a "say/do gap", the person discussing the information in unable to accurately describe his or her own preferences. Journey mapping is one potential tool to aid in revealing the bias found in the "say/do gap" (Liedtka 2015).

The contradictions in the participants' stories were captured in two columns, one stating what the experts "say" in relation to HCD practices in general and the other capturing what they "do" in their own practice, as stated in the interviews or captured via the journey map. Changes, or shifts, help to provide an appreciative understanding about "what was", to "what is" or "what could be" (Cantore and Cooperrider 2013). This approach helped interpret the narratives by looking more holistically at the changes over time. Effort was taken to go beyond stated norms into a deeper understanding of behaviours, environments, and context during a second pass at the data. When these findings were reviewed within the context of the larger narrative, seven key insights surfaced. These insights can be found in Table 5.3.

Table 5.3: Contradictions and shifts in change agents' HCD practice

Contradictions and shifts in practice	
Say	**Do**
Our employees need a **supportive environment**, both physical and psychological, to enable them in this work. Otherwise, how are they going to do it?	In the beginning, change agents **pushed through barriers** in the organisation to show what could be possible with an HCD approach to work.
The value of HCD is that it gives people a **process to follow**. That is its most important attribute.	Design **practices get meshed together** with Lean, Six Sigma, change management and others.
We feel strongly that **everyone can do this work;** they just need the training and the conditions to make it happen.	Change agents' stories revealed abilities and **interest in design and innovation** in childhood or **earlier** in their career.

Prototyping is the hardest thing for people to do … They are terrified of it.	Change agents often “build to think”—they have artefacts around their work spaces and **frequently bring or create prototypes** in meetings.
We **run many training programmes** and workshops to reach as many people as we can in our organisation.	Change agents try new practices with users and each other, often holding exchanges with other companies to show how they approach the work. They **attended very few formal training workshops.**
Organisations are **data driven** and want to know about the dollar value and impact of design.	The change agents **demonstrate deep skills at telling stories** and creating immersive experiences for stakeholders to “feel” the value and the needs of the users.
It's important for the learners in our organisation to **find their "tribe" within the company** so they don't feel alone in the organisation.	Change agents have a tight partner or two within their organisation, a well-connected network inside their organisation, and a **thriving externally facing group** of HCD change agents.

The descriptions of the HCD practice needs of others in their organisation were easily identified in the coded transcripts and typically came as a direct answer to a question. The information about their own practice was more often pieced together through discussions throughout the interview and more often through the discussions and visualisations captured from the journey map exercise.

As a whole, the experts described the struggles that people within their organisation face in practising DT and creating the right conditions to allow it to thrive. On the other hand, in

discussions that elaborated on their own practice, they told stories of what they had done to counter some of the challenges and what they had found to be energising and useful over time such as storytelling, partnership, networking, and active creation of ideas. This data, captured in Table 5.4, helped to address the initial research aims of gathering reflections and enablers from internal DT experts.

Table 5.4: Changes in individual practice with time and experience

Changes in individual practices	
Where the practices began	**Where the practice approaches are going**
Belief in HCD as a process to follow	**Belief in creative confidence as a personal mindset** and trait
Provide white space as there should be no assumptions or starting point for ideas; people need a **"blank page" to begin idea generation.**	**Utilise scaffolding** to build up 20% of an idea, sometimes through a scenario or prototype, to jump-start people's ability to create and collaborate.
Bring in the talent and expertise through consulting groups who come in, provide focused help, and then leave the organisation.	**Develop internal teams** who know the organisational culture and the key leaders and who actively support each other throughout the journey.
Teach the individuals who are interested because individual passion is the most important factor.	**Teach people in intact teams** (i.e. they work together) who can try new approaches together and support each other through organisational challenges.
Focus on **skills and techniques.**	Focus on **mindsets and navigating change.**
Apply **methods to products and services.**	Apply **methods to support broader change** and shift organisational climates.

Skills and passion flourish by **building own skills in design** or building design skills in others.	"Success" in the organisation leads to **responsibilities outside of core design area** into broader strategy and change management.

The shifts in practice highlight how these change agents have changed over time based on their years of experience. When comparing the two columns, one can note that the primary shifts have been away from viewing HCD as a simple skill set to teach and acquire to more of a mindset and, when mixed with a combination of methods, it is applied to broader organisational changes and strategic issues. The approach to building capabilities in HCD has been enhanced by identifying a few approaches that better support the early-stage learner. These approaches include working with others in one's work function and enhancing ideas that already have a foundation from which to build.

5.3 Results

With further analysis, the findings combined to form seven key insights that characterise the approaches taken by the change agents.

5.3.1 Insights

The change agents described the struggles that people within their organisation face in practising HCD and creating the right conditions to allow it to thrive. In discussions that elaborated on their own practice, they told stories of what they had done to counter some of the challenges and what they found to be energising and useful over time, such as storytelling, partnership, networking, and active creation of ideas. This data helped to address the initial research aims of gathering reflections and enablers from internal change agents.

Thematic analysis led to eight broad themes and insights. Particular attention was given to behaviours or conditions that enabled the change agents to develop and grow a practice within a large organisation. The eight insights are detailed with illustrative comments, which were anonymised and labelled with pseudonym initials.

Insight 1: Secure an advocate to allow working differently than the predominant organisational culture.

An advocate was found to be important to provide support. According to the change agents, this support often comes in the form of protected time or resources and the ability to act and practice in a way that the change agent deems important for the sustainability of the HCD practice. The advocate may or may not be someone the change agent reports to in the organisation, but either way, they are influential enough in the organisational hierarchy to legitimise the HCD practice (Rauth 2015) to others in the organisation on at least a small scale.

> He really has helped me out a lot. He has the political understanding and the political savvy to give me the air cover I need. He doesn't do this work, and probably never will, but he trust me and he let me run with it. Without him this would have been squashed right from the start. (Change Agent VN)

Insight 2: Develop a close work partner for emotional support and learning development.

Just as the themes revealed the change agents' practices had shifted from focusing on individuals who had passion and interest to people in "intact teams", the change agents also shared the importance of having a partner. Sometimes referred to as "partner-in-crime", "my go to", "my sanity", or "my most trusted colleague", it was emphasised that the partnership and support provided by others in the organisation is critical to creating a flourishing HCD practice in a large organisation. The partnerships take two avenues, one who is a peer day-to-day partner and one an organisational leader who helps to provide some form of "protection" or "advocacy" within the organisation when necessary.

> She talks me off the ledge sometimes. She has a much calmer demeanour than I do and knows how to navigate in this organisation. After a hard day we'll just go grab a drink sometimes and blow off steam. It really helps to me keep going in a place like this. (Change Agent JF)

> I miss working with her. We were very close and we created a number of new approaches together for [their organisation]. We radically changed things around here and we learned together. We worked together very well and I think others could see that. (Change Agent HN)

Further iterating the importance of trust and playfulness, the change agents have deepened their support network with one or two other peers inside their organisation. Additionally, they are provided with flexibility or protection to try out the methods within their work responsibilities. The change agents viewed these relationships as key to keeping their excitement and energy in their sometimes-challenging HCD endeavour.

Insight 3: Display a deep curiosity and commitment to people.

"People-people" is a phrase that the change agents often used to explain how others describe them and how they describe people that they believe have an aptitude for using HCD methods within a large organisation. They did not call out personality traits such as extroversion or introversion, but rather referred to a mindset of being empathetic and curious about others around them.

> The ones that I think were the best, I think if there were sort of personality traits they tended to be very optimistic people. They were already kind of people-people. Not too methodological. (Change Agent SP)

> I can tell right away if people are going to have a chance to become good at this or not. Those that really get into their users, I mean not just gather data about them but really want to know about their real needs. Those people get it. (Change Agent SI)

The change agents talked about their own passion for learning about their users, but additionally they talked about others in their organisation. They discussed their deep connection to diverse roles across their organisation to "help get things done". Many of them also had a responsibility to help other organisational employees learn and practice HCD. They shared the excitement they have when people they are coaching begin to "get it".

> For people who are really looking for it and are starting to get it, you can see their transformation. It's great. It's like watching people blossom. It's amazing, seeing them step into this confident place. It's like … seriously amazing. (Change Agent MK)

Insight 4: Tell stories, share experiences, and work verbally and physically.

The change agents had many stories about users and what they need in the context of their lives. They spoke of having an "unquenchable thirst" for gathering stories and insights

about their users to deeply understand their lives and their needs. They shared many examples of how they use these stories with people at all levels of the organisation. They included images of the people in their stories in corporate presentations; some have posters or photos on the walls of their workplaces and others have artefacts that remind them about experiences they have gathered while “in the field” learning more about their users.

They also use storytelling as a way to pass along the purpose and history of what they believe to be a unique way of working within their organisation. They share with other employees in the organisation to help them experience a different way of working and behaving that differs from the norms of the rest of the organisation.

It is clear that a cycle has emerged that further elevates change agents as a sought-out resource among their peers, by continuing to reinforce a growing body of knowledge. This is represented in Figure 5.3. The stories and learnings are not just shared with people inside their organisation; they are often shared more broadly through social media or through personal interaction with their broader network.

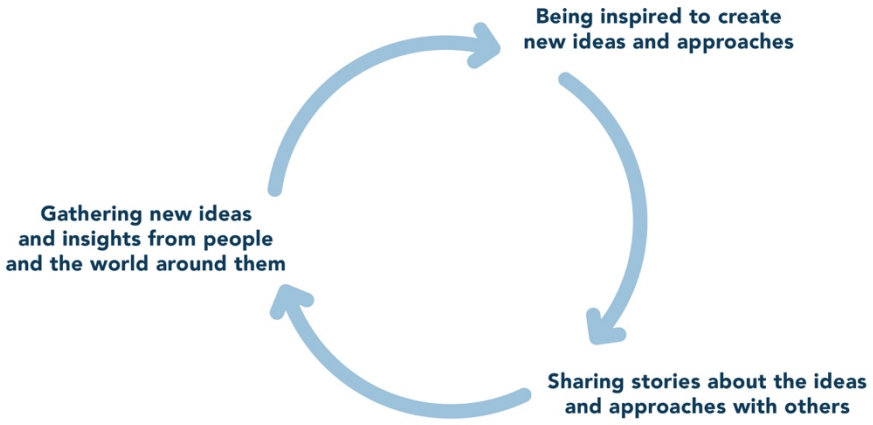


Figure 5.3: Change agents as a resource

This cycle is further demonstrated in a comment by one of the change agents:

> I connect things. I was born for social media … I read 100 things a day. I connect things I find with my lived experience and I share it out. People are constantly sending me new

> articles and links and ideas. It grows and grows. [Note: at the time of interview, "HN" had nearly 40,000 followers on Twitter.] (Change Agent HN)

The change agents demonstrated this same value and understanding of the potential impact of storytelling on the organisation. Additionally, they expanded the purpose of storytelling beyond sharing the needs of the user and into using stories as a tool to potentially influence and shift the working norms of those with whom they interact inside their organisation.

Insight 5: Improvise methods. Mix together methods of design with others when needed.

The change agents discussed a growing competency in improvisation. Their version of improvisation is to have the skills to read the situation at hand, in this case in a work context, and adjust in the moment. They spoke about "improv-ing" through a high level of skill in design methods, as well as improvising approaches to new organisational situations and conditions such as new leadership, new goals, new efforts, and new teammates. They see this flexibility as critical to staying connected to the priorities of the organisation and to the people who both work in it and lead it.

> That's what really made her [a specific HCD expert] stand out from all of the others; she focused on improv., being able to go with the flow, and teaching others to be able to bring what's needed in a particular moment. It's not a set approach.

> [Good designers] recognize changes in energy or mood of those in their meetings] and know what to do about it, how to adjust, and how to bring the group back in a meaningful way. (Change Agent SP)

With regard to HCD methods and their use to address challenges within their organisation, the change agents expanded upon their discussion of improvisation to conjecture that it is also used as a demonstration of mastery of the methods, stating that mastery is achieved when an improvisation of approaches blurs the lines between HCD and other methods. HCD, they stated, provides a great method and set of tools to follow for those who are in the early learning stage. Participants also shared that after much repetition and practice, they began to evolve their own HCD practice by adding in approaches from other methodologies like change management, strategic management, or Lean.

> It's like dancing … In the beginning, you are doing the dance steps that you were taught; you are focusing on the steps and on what you learned. At some point something clicks and then you are able to improvise, you are able to actually listen to the music and respond. That's your moment of actual dancing. (Change Agent MK)

HCD change agents frequently work to determine the fit between the methods of design and the organisational culture. They continue that improvisational approach in the way they apply and create new methods for problem solving and, in their mindset, as they adjust to changes within their organisation.

Insight 6: Build "scaffolding" to offer up ideas to get the work started and to refine and reflect along the way.

The change agents felt that prototyping and experimentation are some of the most intimidating and fearful design methods to others in their organisation. Moving into the stage of making ideas tangible and descriptive first requires the willingness to trust that others will not harshly judge the ideas represented. Second, creating physical representations or images, putting ideas into a form that others can contribute to and collaborate on, is beneficial:

> I think … the biggest disappointment that I continue to see is that even with all this, people are still afraid to prototype. They're still afraid to put an idea out there. They still want it to be right every damn time. And it's so infuriating ... After all this—after throwing millions of dollars into Post-its that you just rip off the wall and throw in the trashcan. You're not willing [to prototype an idea]? …That's infuriating to me. (Change Agent SI)

Many of the change agents lacked confidence in this phase of the process earlier in their career. They discussed the awkwardness they experienced when trying to follow the HCD methods, but eventually they learned how to create and prototype in ways that push ideas further and enable others to collaborate with them.

> I think part of it to me is that it goes back to the idea of human-centered design is really like scaffolding for creativity. Because inherently it was designed for people who have lost that creative confidence.
>
> The concept that the professors coined after the project was 'endowed progress', this idea that if you set people 20% of the way towards completing a path, they're almost double the

> chances that they'll see it through to completion. I sort of took that and we rephrased it as 20% creativity. (Change Agent BN)

Insight 7: Approach building HCD capacity as a change in behaviour and not strictly a development of skills.

HCD was viewed by many of the participants in this study as an organisational capacity or individual skill to acquire. The change agents shared that the people in their organisation initially feel they can attend a workshop and be "ready to go", but in reality, it requires application and repetition and exhibits properties of a behaviour change, not strictly a skillset. It takes time and small steps for others to participate and gain an understanding and experience.

> Plan on it taking a long time. I mean you're changing people—the way that they work. I mean they've invested decades of learning how to work up until this point and you're asking them to change. And it's not obvious. I think we say six to ten experiences. Repetition. And fun. (Change Agent SI)

In some instances, coaches are provided to organisational learners to help guide their learning experiences. The working environments of the change agents have physical artefacts that remind people of the purpose behind the design projects. Whiteboards, prototyping supplies, and work spaces that allow groups to work openly were described as a way of supporting the HCD way of working. If those interviewed have control over the projects assigned to novices in their organisation, they take efforts to ensure they have lower risk projects so they have a better chance to feel a successful outcome and learn how to practice design in a real organisational context without as many organisational pressures.

Insight 8: Create a playful and trusting workplace for teammates.

Trust and play were viewed as synergistic values in that one enabled and supported the other. The majority of change agents interviewed mentioned their pride in creating environments where people can take risks, and that the people who worked with them feel supported and empowered at work. They talked about being able to not only share mistakes they had made, but also to openly critique each other's work. A balance of serious work critique and playful humour seems to balance out the work team's dynamic

cultural environment. One mentioned the value in keeping the team's connection intact, while "performing" for others was captured in this interview:

> They made silly hats together and laughed. She gave the team a collective identity … so they could perform for others when they didn't know what was about to hit them. She looked at 'How do I actually perform in the moment with my teammates in a supportive kind of way?' Her ability to do this made her team stand out from the others. They were slower to get going with ideas because they spent time upfront in connecting, but once they connected together their ideas went further faster, and people noticed. (Change Agent SP)

5.3.2 Emerging model

It is evident that the change agents adapted their practice over time based on their experiences within their organisation. Culture is defined more broadly across an organisation as assumptions and values, whereas climates within organisations embody practices and routines (Ostroff, Kinicki, and Tamkins 2003; Schein 2010). The findings suggest a combination of local conditions across functional boundaries, henceforth discussed as a "microclimate" that supports the development of the HCD within an organisation. These were developed into a microclimate model (see Figure 5.4).

Microclimate Model

Overarching combination of **advocate support and protection** along with **enabling conditions** and **change agent behaviours**. Together they create the ability for HCD to flourish in a group of people, despite it not being a predominant culture of the broader organisation.

Conditions

ADVOCATE
Leverage support for time, resources, and protection to work differently than predominant organisational culture.

PARTNER
Have a partner for emotional support and to work with.

PLAY
Create a playful and trusting workplace for contributors.

CAPACITY BUILDING
Begin with small low-risk projects and build up as desired skills, mindsets, and behaviors increase.

Behaviours

CONNECTING
Display deep curiosity and commitment to people.

IMPROVISING
Mix together methods of design with methods for change, lean, and others when needed.

STORYTELLING
Share experiences and work verbally and visually.

SCAFFOLDING
Offer up ideas and examples to start and to refine the work.

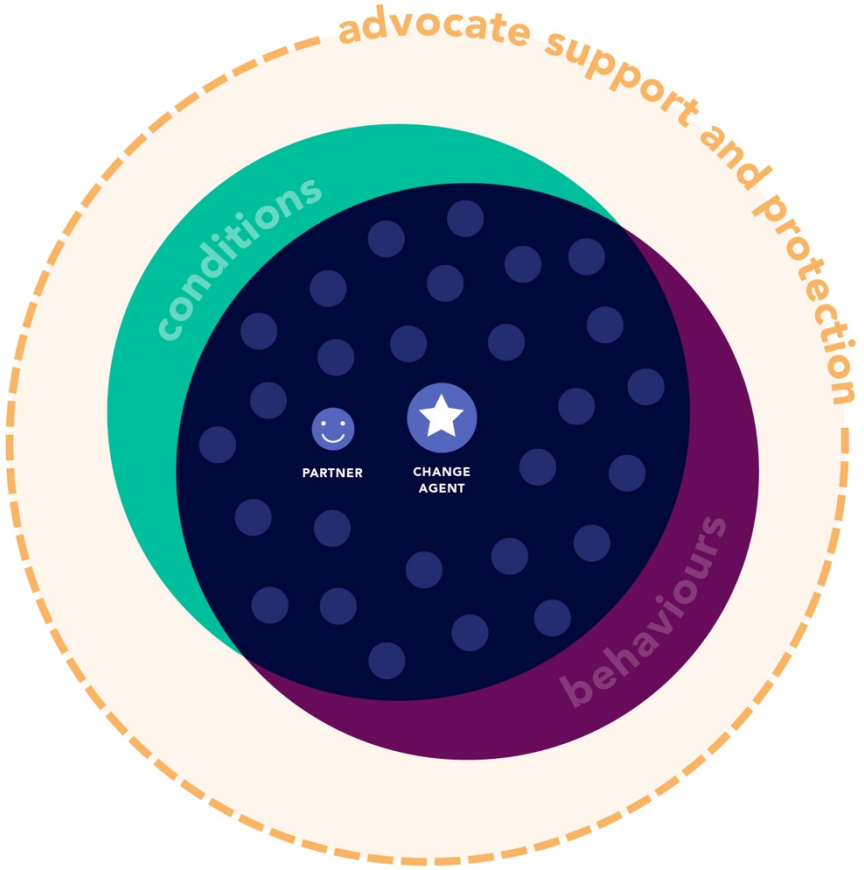


Figure 5.4: Initial proposed microclimate model

In every instance, the change agent is considered counter to the predominant culture and way of working within their organisation. Change agents seem to have found a novel way to create a sustainable internal HCD practice in the day-to-day environments despite the prevailing organisational culture. A microclimate in meteorology terms is a climatic condition within a relatively small area, which is distinct from the predominant climate (Encyclopaedia Britannica n.d.). This climatic condition supports the development of unique flora and fauna from that surrounding it.

It is argued that a “microclimate” of unique attributes enables HCD, despite a prevailing organisational culture that is different to that of the developed microclimate. This emerging conceptual model, as illustrated in Figure 5.4, shows that each individual microclimate has a change agent at the centre as the catalyst supported by an advocate who provides a level of organisational protection to support the effort. The results of this study of change agents postulate that the microclimate forms with the inclusion of a partner, followed by additional people that are exposed to HCD who choose to become a part of the environment practising these new norms. Enabling conditions support the microclimate, as well as identified behaviours observable by others. It suggests that the microclimate is characterised by the change agents’ individual practice behaviours, as well as the physical and psychological conditions they create.

5.4 Discussion

This study collected the experiences and views of a range of industry professionals experienced in HCD and in embedding those practices within their organisation. Outcomes of this study identified common patterns that more clearly reveal what occurs in the often-elusive internal HCD practice within an organisation. This contributes to what is currently a marginal understanding of interorganisational innovation and HCD in the literature. The outcomes also clarify shifts in practice identified among a cross-section of organisational experts. These shifts could create a clearer path for others looking to develop their internal practice and who would like to better position it in a trajectory more consistent with the thinking of experts in the field.

Detailed analysis led to a set of eight insights that clarified and contextualised the behaviours the change agents exhibited when reflecting on the enablers of their internal HCD practice:

- Engage with an advocate to provide support and protection;
- Don't go it alone, have a partner.
- Demonstrate a deep passion and interest for people;
- Freely share stories, verbally and physically;
- Practice an improvisational approach;
- Build "scaffolding" both to make ideas more real and to help others contribute;
- Approach building HCD capabilities as a change in behaviour;
- Create a playful and trusting workplace.

5.4.1 Insights on behaviour

The study captured a number of individual behaviours that the HCD change agents shared during the interviews. In addition to their stated affinity for the people they worked with, they also used their understanding of people in general to connect with them through stories shared both verbally and physically. They leveraged this ability to connect with people across all levels of the organisation. The experts interviewed learned to adapt and adjust or "improv." their way into finding approaches that worked within their respective organisations (Nixon 2012; Weberg and Weberg 2014). The experts interviewed stated that they were not capable of rapidly changing the entire culture of their organisation and instead focus on creating novel approaches to support an internal HCD practice.

Research supports the view that creating a physical element, or prototype, is one of the most effective ways of demonstrating the value of a design approach to create a more compelling and memorable story (Amabile and Kramer 2011; Liedtka 2015; Schrage

1999). Prototyping is more recently being featured in the business community as a key element for fostering innovation (Schrage 1999), and experts in this study believed that avoiding a blank page through scaffolding of ideas may be one way to get people to begin to make progress. Advocates of HCD have argued for many years that people within organisations need to think like designers (Brown 2008) and place emphasis on the mental processes of designers (Martin 2009). Additional research expanded this notion and placed a high value on "design practising" and the need for more material practices that result in visual representations and creation of artefacts (Coughlan, Suri, and Canales 2007; Stigliani and Ravasi 2012). The experts in this study showed their understanding of the value of prototyping and the creation of artefacts. They used prototypes not only to solve design challenges, but also as an approach to communicate to others the value they saw in HCD as a practice.

5.4.2 The emerging microclimate model

The psychological environments the experts created with those they worked with were a significant area of discussion, uniquely described as playful. A prerequisite of play, trust sets a foundation on which groups can adjust to mistakes (Covey, Link, and Merrill 2012) and share with each other without fear of retribution (Tucker and Edmondson 2003). In large organisations such as those represented in this study, it is important to have organisational boundaries to help people know what they are to do and with whom (Dougherty and Takacs 2004). Dougherty and Takacs' study showed that a boundary of team play enables what they called "heedful interrelating" (Dougherty and Takacs 2004: 1). Heedful interrelating consists of individuals connecting in a meaningful way, which allows for an easier formation of multiple teams to conduct work. As such, play and trust are viewed as synergistic.

These internal organisational change agents, who have had long and impactful careers, have developed novel approaches to creating a HCD entity within organisations before it is fully developed or supported by the organisational culture. Having a command of design methods, people skills, and the organisational savvy to interpret and understand the inner workings of the business are not skillsets easily found within organisations (Bucolo and Matthews 2011). This study postulates that the key insights, when viewed as a whole, form an outline model of a microclimate within the context of the larger

organisation where insights take shape. The model details evidence-based behaviours and conditions that are suggested to be important to enable HCD to flourish within an organisation. This novel and emerging model is further explored and developed in subsequent chapters.

5.5 Chapter conclusion

This study collected personal narratives using semi-structured interviews and personal journey maps of individuals who are experienced and known for bringing HCD successfully into their organisation. The input of HCD change agents from nine organisations in a range of sectors enabled exploration of HCD as an approach to innovation and creativity. Each change agent was attempting to work in a way that was not viewed by them and their teammates as the predominate organisational culture. The study sought to convey how HCD has been successfully enabled, through the expression of common heuristics across change agents. Eight common conditions and behaviours were identified.

These findings were brought together into a common approach called the microclimate model. They shed light on how practices for HCD could be developed by other individuals. With further refinement, the model may offer guidance as to how a microclimate can be established within a larger organisation to foster HCD practices. Understanding a growth approach through the development of additional HCD microclimates or expansion of existing ones would further the impact of the research for large organisations.

Having learned from non-designers in Chapter 4 and HCD experts in this chapter, Chapter 6 expands our understanding of the learning journey by considering the early-stage development of HCD. It explores the rarely seen learning journey and the early application of HCD into practices within healthcare over a 12-month period and considers the perspectives of the learners and of the coaches who help them to succeed.

Chapter 6: New learners' and coaches' experiences of developing HCD capacity for innovation within healthcare

6.1 Introduction

Chapters 4 and 5 discussed the findings related to two different groups. The first was a group of nurses who as non-designers had not received any training in innovation or HCD. They shared insights on the conditions that enable them to be champions of innovation and change by reflecting on their experiences, which could be inside or outside a work setting. At the other end of the spectrum were individuals who had successfully implemented HCD, referred to as change agents. They had developed the capability for themselves and others to approach innovation and change through the practice of HCD inside their organisation, despite the broader organisational culture or context. The first study provided new insights to innovation enablers that were important to those non-designers who had no significant experience in HCD or innovation at work. The second study of successful organisational change agents resulted in the development of a novel microclimate model to convey how the leaders across industries have created innovative "microclimates" to enable innovation using HCD.

Research has focused on how HCD can build innovation capability in an organisation (Carlgren 2013a; Carlgren, Elmquist, and Rauth 2014; Martin 2011), but little has focused on the capabilities and experiences from an individual learner's perspective within an organisational setting (Carlgren 2013a; Seidel and Fixson 2013). Studies of students have explored how novice multidisciplinary teams learn and successfully practice HCD in an academic setting (Seidel and Fixson 2013) and how experts practice design in consulting settings (Blomkvist 2010; Hargadon and Sutton 1997, Jahnke 2013), but studying this phenomena of novice HCD learners in organisational settings, particularly within healthcare, remains unexplored. In this study of new/novice learners, efforts were taken to identify common patterns in the ways they learn, the stages of learning, and the effect that their learning, and the context in which they attempt to apply it, may have on each other.

This study focused on the longitudinal journey of the individual learners and their coaches in a single case over time, which provided a more in-depth analysis of their

experiences (Savin-Baden and Major 2013). This approach begins to fill in the gaps in the knowledge of HCD novice learners within an organisational setting, by following the learners in the not-often studied context of their workplace (Carlgren 2014; Seidel and Fixson 2013). Qualitative ethnography was used to study the social phenomena of learning and applying HCD as well as the exploration of the nature and context surrounding it within an organisation (Hammersley and Atkinson 2007; Reeves, Kuper and Hodges 2008). The research was not conducted with an existing theory in mind, but during the course of the data gathering, basic model ideas were crafted for the participants, iterated upon, and compared to existing theories available in the literature. Iterative co-design sessions were held with the study participants to aid in the quality of the research and to develop common frameworks that guide learning and development within a healthcare context. Resulting was the application of a new skill-building model that emphasises the stages of learning in an applied context, which is reflective of the participants. The output is intended to serve as an actionable tool for those looking to develop workforce capabilities in HCD.

6.1.1 Study aims and objectives

The aim of this longitudinal study was to follow the learners' journeys, explore their experiences, and use the resulting data to inform the development of a framework to guide HCD implementation within an organisation. This bridges the gap between the enabling conditions for creativity and innovation identified in the study of nurses who had never been taught HCD (Chapter 4) and the successful microclimates created by the experienced and successful change agents (Chapter 5). In this chapter, the experiential data collected is reported and explained, then developed into a model that seeks to explain the development of design competency. In Chapter 7, the findings and model are taken forward and combined with key conclusions from Chapters 4 and 5 to produce a detailed HCD learning framework.

The specific objectives of this study, therefore, were to

- capture individual perspectives and reflections on the learning journey;
- develop insights and identify enablers of the learner's journey as they apply to their perceived and observed experiences over time;

- inform a model of learning and framework of the learner's journey from personal and organisational perspectives.

6.2 Method

It is of value to explore a learning experience through a longitudinal study approach, as learning a new capacity and attempting to perform it within an organisation takes time (Benner 1982, 2004; Dreyfus 2014; Dreyfus and Dreyfus 1980). As such, so does observation of the implications of that activity. Because of this, the developmental nature of a longitudinal study was deemed the best fit for the study (Pettigrew 1990).

Application of a longitudinal study approach in this context is relatively rare, with an example emerging only recently as this study was being written (Amabile and Pratt 2016). Amabile's (1988) initial study created the oldest and one of the most heavily cited theories of individual creativity and organisational innovation. An update to that work, also using a longitudinal approach, has recently been published (Amabile and Pratt 2016). They adopted an online diary study to expose the day-to-day experiences of individuals working in organisations. This study of individuals learning HCD for creativity and innovation built on Amabile's work by focusing on the learning aspect of creativity and innovation with the change in events over time (Creswell and Miller 2000; Lincoln and Guba 1985; Ponterotto 2006).

The study described here sought to identify the enabling conditions for individuals to learn and apply HCD within an organisation (Amabile and Pratt 2016; Seidel and Fixson 2013). This context was gained by studying learners and their coaches in real-time observations and conversations as the events occurred over the course of one year. The emerging understanding of the learner's journey is applied to the development of a design competency model informed by co-design and iterative feedback from the study participants (Boyd et al. 2012).

6.2.1 Context

The study was designed around the KP Innovation Catalyst programme; see Appendix 4 for a poster image of the programme overview. This provided a unique opportunity to study a group of learners and coaches during their journey on an innovation programme

in a healthcare organisation. This research study was not an evaluation of the Innovation Catalyst programme, but focused on the learning experiences of the individuals, both learners and coaches, who were a part of the programme. This was an important development to fill the knowledge gaps of real-time learning and implementation discussed in Chapters 4 and 5, where potential learners and those with years of experience were the focus of study.

6.2.1.1 The Innovation Catalyst programme

The Innovation Catalyst programme, hereafter called the programme or the Catalyst programme, began in 2014 and was in the third year of operation during the time of this study. The programme is run jointly by KP and the Center for Care Innovations (CCI, www.careinnovations.org). CCI is a grant-making and collaborative network of providers specifically serving economically disadvantaged populations. The Catalyst programme is described as "a network of local innovation champions trained to use human-centred design and DT to add value to existing projects and initiatives in health care organizations" per the programme's website (Catalyst n.d.). The primary components of the programme are skill development, principles and methods, online learning community, coaching support and events, and workshops.

The programme was selected as the focus of the study because it is regarded as an exemplary internal capability programme within the design field, as judged by the Design Management Institute (DMI) and an international group of experts. DMI awarded the Catalyst programme the Design Value Award in 2015 (see Appendix 3 for the submission summary) for its novel and impactful approach to teaching HCD to new learners in healthcare organisations. As such, judgement sampling was used to select the programme, as it is in line with the philosophy of this research and enabled a focus on learning from experts and an exploration of what works and how. The DMI award provides an objective assessment of the quality of the programme. Additionally, KP had an affiliation with the programme, and this provided more open access to the participants. Potential bias based on the organisational affiliation is discussed more in Chapter 3, Methodology.

6.2.1.2 The participants—learners and the coaches

All participants in the Catalyst programme, both learners and their coaches, were approached to ask for their interest in being included in this research study during the 12 months of their learning journey. Learners were required to apply for the programme. Selection included the prerequisite that learners had the support of their direct manager to spend 20% of their time on the programme over the 12-month duration. It was also requested that the learners apply in conjunction with one or two other individuals they worked with regularly, and that they had an existing project effort they could use to apply their learnings to. Applicants of the Catalyst programme were chosen by the programme administrators from the CCI and KP. In total, there were 48 learners in the programme.

Per the programme website (Catalyst n.d.), the selected applicants were provided with learning opportunities, learning materials, a coach, and educational materials to help them build their innovation capabilities using "human-centred design methods and mindsets". The goal was to help "drive different ways of working in their organizations" by aiding them to become

- an innovator: lead and participate in design and innovation activities to tackle familiar problems in new ways;
- a champion: bring unconventional approaches and thinking to existing projects;
- a change agent: over time, facilitate others to apply HCD to their innovation initiative.

This would occur through exposure to new methods as well as how to apply them through classroom learning, coaching, and guided application.

> They [the coaches] taught us that there is a teachable, learnable skillset, but also a level of skill and expertise that we can all aspire to. (George Su interview 2015)

Twenty-one organisations participated in the Catalyst programme, and all were engaged in a coaching relationship with KP HCD expert coaches. The organisations were asked to send participants in teams of two or three to help support the internalisation of the

learnings. Table 6.1 lists the participating healthcare organisations and the number of participants from each.

Table 6.1: Participating organisations

Alameda Health System	3
Asian Americans for Community Involvement	2
Central City Concern Clinic	2
Kaiser Baldwin Park Medical Center	3
Kaiser Coalition of Unions	3
Kaiser Garfield Innovation Center	2
Kaiser Greater Southern Alameda Area Medical Center	2
Kaiser Los Angeles Medical Center	3
Kaiser South Bay Clinic	2
Lifelong Medical Care	2
Olive View UCLA Medical Center	2
Oregon Primary Care Association	2
Petaluma Health Center	2
Planned Parenthood of Orange County	2
Planned Parenthood of San Bernardino counties	2
Rinehart Clinic	2
Riverside County Health System	3
San Diego La Maestra Family Clinic	2
San Francisco Department of Public Health	2
San Jose Foothill Family Community Clinic	2
Yakima Valley Farm Workers Clinic	2

The participating organisations represented a range of community-based healthcare organisations serving a range of demographic groups. Each Catalyst programme participant was employed by one of these organisations and was provided the time and support to participate.

The members of CCI and KP recruited participants to the Catalyst programme and provided coaches. The research study then tracked the coaches and new learners, or "catalysts", over a 12-month period. During this time, data was collected through a variety of sources to allow for better triangulation and to minimise researcher bias. The data collection included observations, ethnography, artefact analysis, and user input.

6.2.2 The programme and opportunities for data collection

A number of components of the programme supported the learners' journeys, which were used to collect data to understand the experience. The data collection focus was on the coaches' interactions with each other as they reflected on and summarised their team's activities and on the interactions among the learners. Attending the individual coach and catalyst sessions proved problematic from a scheduling standpoint as the timing changed frequently. The other sessions provided ample real-time viewpoints of the learners' experiences based on the coaches' reflections in the coaches' peer group calls and directly from the learners through their questions and discussions as a group on learning exchanges and educational sessions. In-person workshops furthered the opportunity to observe interactions and discussions in real time over an extended period.

6.2.2.1 In-person workshops

The catalysts had two in-person gatherings during the course of the study. The purpose of in-person gatherings was to connect and create a network of learners to provide introductory training to serve as a common learning foundation and to set expectations for the duration of the programme. This resulted in 32 hours of observations and field notes. All large and small group presentations were attended, and approximately half the individual team presentations were attended.

6.2.2.2 Individual coach and catalyst sessions

The coaches were asked to meet monthly, usually virtually, with the two catalyst teams they were responsible to coach. The purpose of these meetings was to provide frequent points of support and advice as the learners continued to learn and apply the design methods in the context of their organisational work. These meetings took place using a video-conferencing service and were typically one hour in length. Six sessions were recorded, providing six hours of "remote" observations of the content and dynamics of the coaching sessions.

6.2.2.3 Coach peer group calls

A primary source of data was a series of 12 video calls with the coaches and method experts who were responsible for coaching the learners in the programme. These calls were each 60 to 90 minutes in length and occurred each month, resulting in 15 hours of recorded and transcribed interactions. The calls were viewed as a key time that the coaches could provide and update on their team's progress, offer each other advice and perspective, and reflect on the experiences more deeply. Typically, the coaches' peer group calls took place between one and two weeks after their catalyst team calls. All coaches' peer group calls were recorded and transcribed.

6.2.2.4 Catalyst peer group calls

Peer-to-peer coaching was provided for the catalysts in which they were asked to share their progress, a challenge they had overcome, and a challenge or problem they were having for discussion and consultation with their peers. For each call, a subset of catalysts shared to allow more time for discussion. All peer group calls were recorded and transcribed.

6.2.2.5 Catalyst learning exchanges

Learning exchanges were also provided via virtual video sessions to support the educational needs of the catalysts at various phases of their learning journey. Set topics were taught by a combination of programme coordinators and coaches. During these calls, slides were typically used to reinforce the learnings. Questions were posed to the catalysts to gather their experiences in the topic area, and discussions were prompted to

further the understanding of the topic among the group. All learning exchanges, as captured in Table 6.2, were recorded and transcribed.

Table 6.2: Summary of learners' group collaboration/education sessions

Session	Hours and data capture method	Venue	Date	Purpose	Attendee dynamics
In-person kick-off and training session	20 hours of observations, artefact gathering, and field notes	In person	October 2015	Develop catalyst network and provide exposure to basic skills, resources, and programme expectations	Coaches and outside expert conducting training, and learners listening and practising techniques
Learning exchange	1 hour of live listening; meeting recorded and transcribed	Virtual video	December 2015	Connect learners to share with and guide each other	Learners sharing progress, successes, and posing questions
Learning exchange	1 hour of live listening; meeting recorded and transcribed	Virtual video	January 2016	Connect learners to share with and guide each other	Learners talking together; coaches providing structure for session
Learning exchange	1 hour of live listening; meeting recorded and transcribed	Virtual video	February 2016	Connect learners to share with and guide each other	Learners talking together; coaches providing structure for session
In-person innovation fair	12 hours of observations, artefact gathering, and field notes	In person	March 2016	Show project progress to other participants and learn from each other	Active sharing and exchanging advice in morning, followed by facilitated learning sessions by coaches

Session	Hours and data capture method	Venue	Date	Purpose	Attendee dynamics
Education: measuring the impact of innovation	1 hour of live listening; meeting recorded and transcribed	Virtual video	April 2016	Teach methods and approaches to measuring innovation	Coaching experts teaching learners
Learning exchange	1 hour of live listening; meeting recorded and transcribed	Virtual video	May 2016	Connect learners to share with and guide each other	Learners talking together; coaches providing structure for session
Education: prototype and experiment	1 hour of live listening; meeting recorded and transcribed	Virtual video	June 2016	Teach approaches and purpose of prototyping and rapid experimentation	Active sharing and exchanging advice in morning, followed by facilitated learning sessions by coaches
Learning exchange	1 hour of live listening; meeting recorded and transcribed	Virtual video	July 2016	Connect learners to share with and guide each other	Learners talking together; coaches providing structure for session
Education: conducting pilots	1 hour of live listening; meeting recorded and transcribed	Virtual video	August 2016	Teach approaches to piloting solutions	Active sharing and exchanging advice in morning, followed by facilitated learning sessions by coaches
Coaching: catalyst team (1–	6 hours of live listening; meeting recorded and transcribed	Mix of virtual video and	October 2015 through	Provide customised coaching to catalyst learners	Variety of 1:1 coaching calls between individual coaches and their assigned

Session	Hours and data capture method	Venue	Date	Purpose	Attendee dynamics
3 people and coach		phone calls	August 2016		site team (all sites listed in Table 6.1, Participating Organisations)
Coaches' peer group	15 hours recorded and transcribed	Virtual video	October 2015 through August 2016	Capture programme learnings and provide peer-to-peer support to coaches	Connect coaches to reflect on interactions with their teams and provide advice and counsel to one another

A variety of artefacts was reviewed. A printed book, the *Innovators Guidebook,* containing the methods, context, and rationale, was provided to the learners at the first kick-off session. Method cards were also provided, which served as a quick reference summary deck of the guidebook. Each card contained information on one method, and the cards were bound together with a ring allowing the cards to be removed or re-sorted at will.

Last, a website was available containing the same information on the design methods for innovation, the mindsets that were taught during the kick-off meeting, and additional context for the learner. The website had a posting functionality allowing the learners and coaches to have discussions together and post tools and documents to share among the cohort.

6.2.3 Recruitment

The catalyst participants, coaches and learners, comprised individuals in a wide array of roles, including nurses, physicians, process improvement experts, innovation and design experts, managers/directors of departments or service lines, quality and safety leaders, and so on. Their roles were based in hospitals, clinics, or supporting healthcare business office areas across the western US.

All participants were invited to take part in the study, and all chose to participate. Forty-five learners were divided between KP and CCI clinic/hospital network members (see Table 6.1). The coaches, eight in total, were all employees of KP.

6.2.4 Procedure

Each participant was provided information about the study in an email and briefed in person off-site as they were geographically distributed across 1,056 miles. Per the IRB agreement, their informed consent was obtained via their participation in the online survey and an opportunity was further provided for clarification and opt-out during the in-person kick-off session.

At the first in-person meeting with all participants, the researcher was introduced to the group and provided 15 minutes to further discuss the research study. The researcher made a verbal presentation about the study to reinforce the study goals, the participants'

role within the study, their confidentiality, and their option to participate or not. Contact information was provided and time was allowed to address any further questions and provide clarification if needed. The participants had no clarifying questions other than when they could obtain and share the results of the study. For more details regarding the study guidelines, see Chapter 3, Methodology.

At each of the interactions throughout the study, the researcher announced her presence to participants at all virtual meetings and in-person events. The researcher attended all activities listed in Table 6.2. There were two in-person meetings, one for the kick-off of the programme and one for the mid-point check-in and project update. The participants were primarily employees of organisations outside the researcher's place of employment. Transcription records of the non-KP catalysts outweighed the KP catalysts, and user feedback sessions were used as member-checking opportunities (Savin-Baden and Major 2013) to help counter any researcher influence or bias. In addition, expert-checking approaches (Savin-Baden and Major 2013) were employed.

6.2.4.1 Data collection

Observational protocols were drawn up for the two in-person observations, which aimed to further the understanding of the individual perspectives in learning and applying HCD within an organisational context. The researcher attended the in-person meetings and kept a field journal of the discussions and observations, resulting in 40 hours of observations. The observational protocol included a record of enablers to learn and apply HCD within an organisational context, capturing quotations and stories that demonstrated these enablers. Insights from the nurse study and the change agent study were used to guide observations and prompt comparisons.

Tools and artefacts provided by the programme coordinators and shared by the catalysts and coaches were reviewed and noted in the observational field journal. They were visually displayed on a wallboard to allow for clustering and the placement of visual notes. Notes were created based on identified mindsets, skillsets, processes, and physical spaces as enablers. These were captured in the field notes for further analysis.

Virtual meetings were recorded by the Catalyst programme management, published on the programme's shared portal Basecamp, and made available to all participants. These

virtual meetings were also attended by the researcher in real time and were later transcribed, coded, and analysed. This resulted in 29 hours of transcribed data. A second analysis was undertaken of all field notes and transcripts to compare them to the insights from Chapters 4 and 5.

6.2.4.2 Coding and analysis

The data from the observations, artefacts, and virtual sessions were analysed using thematic analysis (Braun and Clarke 2006), with a comparison of insight categories between the nurse study and the change agent study. To begin, the overall process that was developed is discussed, followed by the concrete stages of data analysis.

To begin, all transcripts were printed and read by the researcher once and then re-read a second time, at which point sections that were deemed interesting in the context of the study were highlighted. These highlighted sections were then entered into an Excel spreadsheet with the individuals' names and organisational associations set up as a category and potential data filter. Comments were placed into rows next to the names of the individuals who made the comments and their organisation. If a coach made a comment about an individual learner, the comment was placed in the row of the coach's name as well as in the row of the individual it pertained to.

Columns across the top of the spreadsheet displayed dates that ran from the beginning of the Catalyst programme to the end date. Each discussion captured was placed according to the time it occurred across separate continuous columns across the time horizon of the study. This allowed the comments to be reviewed in a number of different ways, including at a set time across all individuals, as a group comparing organisations, and as individuals over time. Positive experiences were noted in green text, negative experiences in red text, and yellow text called out interesting notations that were not necessarily of a positive or negative nature. After completion, the spreadsheet was printed and sheets taped together, providing one constant visualisation of the participants' experiences over time, together with their associated emotions through the direct comments and quotations from the learners and their coaches. This complete visual view of the data provided flexibility for analysis and was selected over the automated but more focused digital view provided in coding software. The tangible nature of the paper printouts provided the opportunity to include written notations that

were visible, along with the detailed comments, timelines, and colour coding of emotions within one view.

This process supported the analysis of the data from the study of the Catalyst programme. The data content analysis is discussed next to demonstrate the four-stage process.

6.2.4.2.1 Stage 1

Thirty-two hours of observations were conducted and captured in a journal along with programme tools and artefacts from the participants. Transcriptions of 29 hours of phone discussions were captured and coded. This data was compared to the insights generated from the study of individual needs in Chapter 4 of those looking to lead and champion innovation but who had not received organisational support or training to do so. Comparisons were made to note whether similar patterns and insights emerged from the learners and coaches. The initial transcriptions were paired down to pertinent discussions, and social off-topic conversations were omitted. The remaining transcriptions were placed into an Excel spreadsheet and a colour-coding system was used. Comments that were consistent with the insights from Chapter 4 were highlighted.

6.2.4.2.2 Stage 2

The same process was used as noted in Stage 1, but the point of comparison was the enabling elements identified in the microclimate model discussed in Chapter 5 with the change agents who were considered exemplars in HCD for innovation in organisations. The model was used as a lens through which to explore whether similar patterns and insights emerged.

6.2.4.2.3 Stage 3

The data was reviewed again to identify insights that did not emerge from the exemplar change agents or the nurses who had never been exposed to HCD methods, but were seen as consistent patterns for the catalysts who were novices in their learning journey. Notations were then made for the new experiences that were not identified in the prior studies. These were reviewed as individual journeys over time for each learner, as well

as reviewed across all learners from one month to the next across the duration of the programme.

6.2.4.2.4 Stage 4

The data was developed into 10 framework prototypes and shown to the nine programme coaches and two catalyst learners for initial feedback. The workshops were leveraged for feedback and refinement of the framework prototypes until agreement was reached and refined into an output that was supported by all participants.

6.3 Results

A significant volume of data was collected across the 12-month longitudinal study. The focus of the results reported in this section is an exploration of the key enabling conditions for HCD and innovation in order to develop an understanding of the learning journey exemplified by the learners as they progressed through stages of learning over time. The enabling conditions of the participants' learning journey are detailed first. Additional high-level emerging themes are then detailed, including the culture and learning approach that pertain to the context in which the learning occurred and changes that were observed of the learners over time.

6.3.1 Enablers of the participants' learning journey

The analysis sought to identify enablers of the participants' learning journey as they applied to their perceived and observed experiences over time. In particular, the transcripts of the conversations between the coaches and learners were revealing as themes developed across teams, which evolved as the learners became more competent. Additionally, the context of the work environment itself began to play a more substantial role in learning and applying HCD methods, as some environments provided more opportunity for rapid learning cycles than others. These insights offered a shared understanding of the way individual development occurs over time, which affects and is affected by the context of the organisation. The primary enablers are captured in Table 6.3.

Table 6.3: Enablers identified for new learners

Connection with users	Catalysts voiced how the methods helped them better **connect with and understand the needs of the patients** they served as **well as the personal needs of the staff** in their workplace.
Sharing stories	**Sharing stories** verbally was strongly supported by the **empathy** exercises they undertook. Sharing these stories noticeably reinforced their **motivation and purpose** and the positive perception that others had of them.
Support of advocates	**Sponsors or advocates** were needed to **provide permission and secure resources**. **Coaches** were needed to **provide guidance** on interaction between developing HCD skills and navigating the context within the organisation.
Learning cycles	The coaches expressed a desire for the catalysts to join the programme with a smaller and "less visible" organisational project that they could use to learn to apply the HCD skills **for encouraging momentum and learning cycles.**
Rapid testing	Making ideas more real through **small and frequent tests with the users** was emphasised by the coaches from the first day of training and all the way through the programme.
Role of partners	The coaches noted the slowdown in progress and excitement for the catalysts who lost their learning partner during the programme. The coaches described the **difficulty for one person** to keep the momentum going in an environment that was unfamiliar with the HCD methods.
Trust and play	There appeared to be a **correlation between** those who were more **playful** on calls, even during challenging times, **with those who made more progress** on the project efforts and believed that they **had support** to keep going.
Use of methods	New learners appeared to **lack the experience to deviate from the few HCD approaches** they had learned and **to integrate other techniques, such as Lean and change management, with HCD**. Towards the end of the programme, this phenomenon began to change.

These enablers highlight the importance of the context in which the learning occurred and the way in which the learning was broken down for the new learner. A few key elements particularly characteristic of HCD include empathy for the user's needs, storytelling, and rapid cycles of testing. Advocates and partners were seen as critical to the catalyst learners, as creating change within a large healthcare organisation was expressed as being difficult and frustrating. The advocate provided the learning teams with time to learn that was protected from other job responsibilities and basic resources such as prototyping supplies and access to patients through councils or funding support. The partners were naturally a part of the learning team and this organisational set-up provided a learning partner and encouragement. This encouragement was amplified by the role of the coach.

Strong partnership was seen through the expression of trust and play among the catalyst teams. They more confidently practised the new methods they were learning, shared stories with each other of their experiences and even failures, and demonstrated an overall closer connection, not just to each other and the organisation but also to the purpose of the work at hand.

The coaches continued to encourage rapid learning cycles on efforts that were not seen as front and centre stage to the impending success of the organisation. They expressed the need to try the methods and learn in environments that felt less risky. These learning cycles provided the learners with the opportunity not only to increase their HCD competencies, but also to begin to see them in context with other approaches that were being used within their organisation, such as Lean or change management.

The enablers identified in Chapters 4 and 5 are compared to the findings of this study in Chapter 7, Development of Theoretical Models and a Learning Framework. In that chapter, the comparison across all three studies serves to demonstrate the reinforcing themes that emerged from learners and exemplar practitioners across a spectrum of expertise. Next, three high-level themes that arose from the longitudinal study are shared.

6.3.2 Organisational culture as context

Despite an affinity for people and the work, transcripts of catalyst learners and the coaches' coaching calls reveal that approximately 30% of the catalysts experienced challenges with their work colleagues' low morale, as well as incurring "unhealthy" cultural challenges. They believed that these led to a lack of desire to engage in the work and a resistance to change. Overall, the catalysts struggled with knowing how to both learn and practice the methods, while at the same time navigating the challenging cultural issues within their organisation. For some, it caused their project work and their ability to practice the methods to stall for a few months as they tried to address cultural challenges.

> We did a journey map of process, we had staff going out to capture perspectives, and posting ideas and notes during clinic real time onto idea boards. We did [idea] clustering during staff meeting real time and created idea boards in clinic. What we discovered is that we need help with culture issues because the idea boards revealed bad culture issues based on what was posted. It shocked us actually. We've now been stuck in this place for a while now. (Catalyst learner, improvement consultant)

Other catalysts discovered that the methods could help address some of the cultural issues they were facing. The first statement captures the methods they used to bring people together and the second is a reflective moment one of the catalysts had about why it is so important for users to be involved and how it is different to how she had worked in the past.

> We needed help to shift the culture of the clinic. We've been using lots of brainstorming, process mapping and journey mapping in face to face sessions. [The stakeholders] could see the issues and have a way to contribute. People weren't wondering what we were doing anymore because they were a part of it. (Catalyst learner, clinic manager)

> Just having a meeting where you get a few people like the users and other clinicians to actually look at it and reflect on it just does so much for moral. We've all been on the receiving end of things that are just missing the mark and not what we need. ... Now what I realize is that I need to hear from people. I think a key goal of all this work is to get people to contribute to their own system in a different way, and that alone will be so amazingly useful. (Catalyst learner, consultant)

These statements demonstrate active application of HCD skills to a complex organisational context. Having the competency level in HCD to improvise and adjust the methods they were learning was not a prevalent practice in the new learners. This improvisation of the methods and the ability to mix and match them to suit the situation at hand seemed to require a high level of skill in HCD methods. Most learners lacked the experience to deviate from the rules of what method or tool to use in various situations. In particular, many of them struggled with project challenges that had a cultural element to them, and they did not know how to navigate it successfully and whether or not the HCD approach could aid in cultural challenges at all. Based on a review of the transcripts, 40% of the projects seen by the coaches were noted at some point to be too large in scope. In summary, the learners struggled with how to apply the design methods, either to adjust the scope or to address cultural issues.

It was noted that during their coaching sessions, the catalysts did not discuss other methods to apply, even though most of them were skilled in improvement methods like Lean, Six Sigma, or basic project management methods. The fluidity to improvise methods and techniques that the experts demonstrated was not apparent in the learners during their debrief sessions. They appeared to be in a learning mode for HCD and could only think about how to apply the HCD methods to their challenges during the programme.

6.3.3 Right sizing the learning approach

Being given a high-priority and visible challenge to work on was common for the catalyst learners. Coaches spent significant time trying to re-scope and break the project into smaller components. They struggled with determining which was more important for the catalysts, actively addressing the challenge or learning the skills. The coaches discussed at length the wish that catalysts would join the programme with a smaller and “less visible” organisational project that they could use to learn and try to apply the HCD skills towards. Instead, they often found themselves spending time managing organisational expectations and politics that slowed down and sometimes halted their ability to learn and practice the new skills.

> I took it to heart when you gave me the advice at the kick-off that the people who are most successful apply this in many areas of life, not just their innovation project. I tried it with my

> kids first. We brainstormed about our vacation. It was clunky but they were totally into it. Later that month I ran a brainstorm at my team meeting and I felt better about it by then. It was good to have one under my belt at home for sure. (Catalyst learner, a department manager, talking to their coach)

Both ends of the learning spectrum, from the new learner to the seasoned practitioner, were observed in this study. The two groups expressed different approaches and abilities in using HCD. Some examples are their knowledge in gaining stakeholder support, how they would reframe and re-scope challenges, their ability to creatively problem solve when the situation becomes complex, and their access to other expert opinions and peer support. In all these examples, the coaches demonstrated a greater ability to articulate an approach and provide real-life examples of how it had been accomplished in past work efforts. The lack of experience in these areas for new learners was a source of anxiety. Additionally, environments that were not supportive of a reasonably scoped project or learning through repetition and smaller steps stunted and sometimes stopped their ability to apply their learnings in their work setting. The learners needed to spend extra time learning how to address these deficits in expertise before they could actively apply their newly developing HCD skills. This is demonstrated in this coach's reflection on one of the teams:

> If we were to look at some of those teams who are really struggling and we were to see that they need to really understand, look at what holds people back from change and what it really means to be a change agent. You know, sort of that cultural context. So they are trying to be do-ers but they are getting stuck in the bigger cultural and contextual issues. And they can't practice the methods enough to learn that design can actually help with those cultural and contextual things. They may need these skills first, or they need someone on site to help protect them from that for a while they learn HCD. (Catalyst coach)

Infrastructures were also identified that aided in this learning approach, for example, patient advisory councils that provided easier access to patients to collaborate with, and project team rooms where the work could be put up on the walls for ongoing storytelling and collaboration. These behaviours allowed the teams' learning to happen more quickly and smoothly and provided the opportunity for others in the organisation to contribute or support the work.

6.3.4 Changes in learners over time

In the Catalyst programme, the teams that actively engaged with their coaches verbalised a deeper understanding of the language and methods of design as well as expressing less of a feeling of helplessness with the sponsorship or scope of the project work. They actively engaged their coach to problem solve these areas with them. Also critical to their development was the coach's role in holding them accountable for repeating specific and tangible tools and behaviours multiple times to develop mastery.

> They are working on a project … and they have been waiting to align on that and then get direction from the leaders. They've been waiting and waiting. So I finally just encouraged them to just to get out there, practice their new skills and start learning. They had just waited so long they weren't learning anything. (Catalyst coach)

The learners began the study struggling to find "safe" places for them to apply the new tools they had learned in the Catalyst programme. They were coached to find small ways to begin and were told by the coaches that the important element was to apply and practice as soon and as frequently as they could. One of the first notable areas of development was their ability to use the terms of HCD when asking questions or telling stories to one another. The coaches played a significant role in helping them to do this during the first six to seven months of the programme in particular. As time went on, the catalysts became more interested in what their peers were doing and they took more advantage of the meetings where they could gather and share their work and ideas with one another. By the time they attended their in-person innovation fair five months into the programme, about half the participants expressed how they had combined the HCD approaches with other methods they had learned during their careers.

> I got in front of some of our leaders and physicians at a meeting and I asked them to draw their experience. They didn't do it. And I realized that I didn't have anything in my bag of tricks after that. I was stuck. (Catalyst learner, quality leader, at one month)

> I'm feeling a lot better about my own skills now. The other day I took what I'd learned [in a different programme] about how and why people resist change, and it made me look at field testing my prototypes differently. Then it wasn't just about the idea, but the chance for people to experience it and have an opinion that was heard. I could weave those things

together as I spoke with them and it gave me a whole new approach. I was like, light bulb! (Catalyst learner, physician, at five months)

6.4 Development of the design competency model

Having understood the learning journey through the longitudinal study, the findings were used to inform the development of a design competency model. The model was developed through rounds of user feedback, discussed in this section.

6.4.1 Developing the model

The model was drafted initially by the author and further developed through a series of iterations through co-design sessions. Fifteen different draft paper models were provided to coaches and catalysts in a series of co-design sessions. Figure 6.1 illustrates these sessions with the participants and demonstrates the early-stage user/member iterations and the development of a model. These participants were provided an initial review of the models via a brief video description of each by the researcher one week in advance of the co-design sessions. The purpose of the video was to familiarise them with the models to better prepare them for the co-design sessions in an efficient and descriptive way. The sessions had been planned many weeks in advance based on the participants' availability. The protocol prohibited hierarchical relationships such as manager/employee pairs. The sessions were also kept small, with participants limited to one to three people per session in order to reduce the effect of group think and maximise individual participation. The models were taped to the wall for easiest visualisation of the options. Participants were provided 10 minutes to review all the model options and were then asked to write their comments and sketch changes on the models silently to begin. At the midway point, the comments and edits were discussed, debated, and continuously evolved as a group. Final models with comments and edits were photographed and collected to be reviewed in context with the other session's output to look for repeating patterns in the feedback.

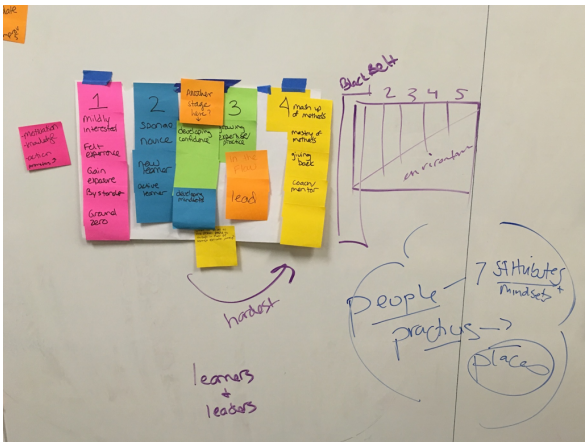
Some materials have been removed from this thesis due to Third Party Copyright. The unabridged version of the thesis can be viewed at the Lanchester Library, Coventry University.	
User feedback session showing first prototype shown on Post-it notes in the foreground.	First sketches of learning model developed with Catalyst coaches, demonstrating a shift over time and additional stages added.

Figure 6.1: Draft model presentations through a co-design session

The models sought to illustrate the importance of context, culture, and infrastructure and the learning stages observed over time. One model that received strong interest during the co-design sessions was the idea of explicitly breaking down the learning experience into different stages. The first prototype and a few comments from one of the sessions will be discussed.

6.4.2 Iterations of the model informed by the literature

A model of the learner and the stages they go through had begun to emerge. The foundational work of Kolb (1984) and Dewey (1938) were reviewed, and the loop-learning approach that can occur resonated; however, the context of learning "on the job" seemed to be missing, and the stages of learning that coaches and catalysts believed to be important were not included.

In returning to the research, the stages of learning were reviewed and another model, Dreyfus' "five-stage model of adult skill acquisition" (Dreyfus 2004; Dreyfus and Dreyfus 1980) was identified and shared. It was selected due to its active stages of learning from

novice to expert. In the five-stage model, the learners' experiences are synthesised and explained as the learner develops through the five development stages to demonstrate a change in ability over time.

Upon further research, it was discovered that this model was later reviewed by Benner (1982, 2004), a nurse researcher, and she found strong parallels with the progression she had studied in the development of the nursing workforce. She theorised that improved practice depended on experience and science, and that skill development was a long developmental process (see www.nursing-theory.org/theories-and-models/from-novice-to-expert.php).

Figure 6.2 shows the models from both Dreyfus and Dreyfus (1980) and Benner (1982).

Some materials have been removed from this thesis due to Third Party Copyright. The unabridged version of the thesis can be viewed at the Lanchester Library, Coventry University.	Some materials have been removed from this thesis due to Third Party Copyright. The unabridged version of the thesis can be viewed at the Lanchester Library, Coventry University.
Copied from original document (Dreyfus and Dreyfus 1980).	Benner's model of skill acquisition in nursing (copyright Benner 1982).

Figure 6.2: Model images from Dreyfus and Dreyfus (1980) and Benner (1982)

In Benner's novice-to-expert model, as in Dreyfus and Dreyfus' (1980) skill-building model that preceded it (Figure 6.2), the stages of development for learners are

- novice
- advanced beginner
- competent
- proficient
- expert.

Dreyfus' and Benner's models were compared with the transcriptions and found to follow the observations and conversations noted regarding the HCD learner's context. A competency model prototype, which identifies the learning stages of HCD, was drafted for review. It was provided to the catalysts, coaches, and 15 thought leaders and academics in the field of HCD.

When asked for the level of usefulness and applicability, 85% of the study participants found it to be useful and applicable. The users also provided feedback that they believed there is a stage not captured in the original models. This new stage occurs when an individual is first exposed to design as an outsider but is not actively trying to learn the methods or mindsets. After a few more iterations, that activity was eventually codified into a pre-learning stage called "contemplation" and added to the developing model.

6.4.3 The final model

After refinement by the participants, the final model was created (see Figure 6.3). The model maps the stages of competency to three broad categories of HCD methods. Three primary attributes were added to the original models of Dreyfus and Benner to ensure applicability to this context and build on the emerging results: (1) contemplation was added as a stage prior to becoming a novice, (2) learning was segmented into three broad categories of HCD methods of need finding, brainstorming, and prototyping, and (3) the segmentation into three categories allowed for the learner to progress at a

different pace in their development of the need finding, brainstorming, and prototyping methods.

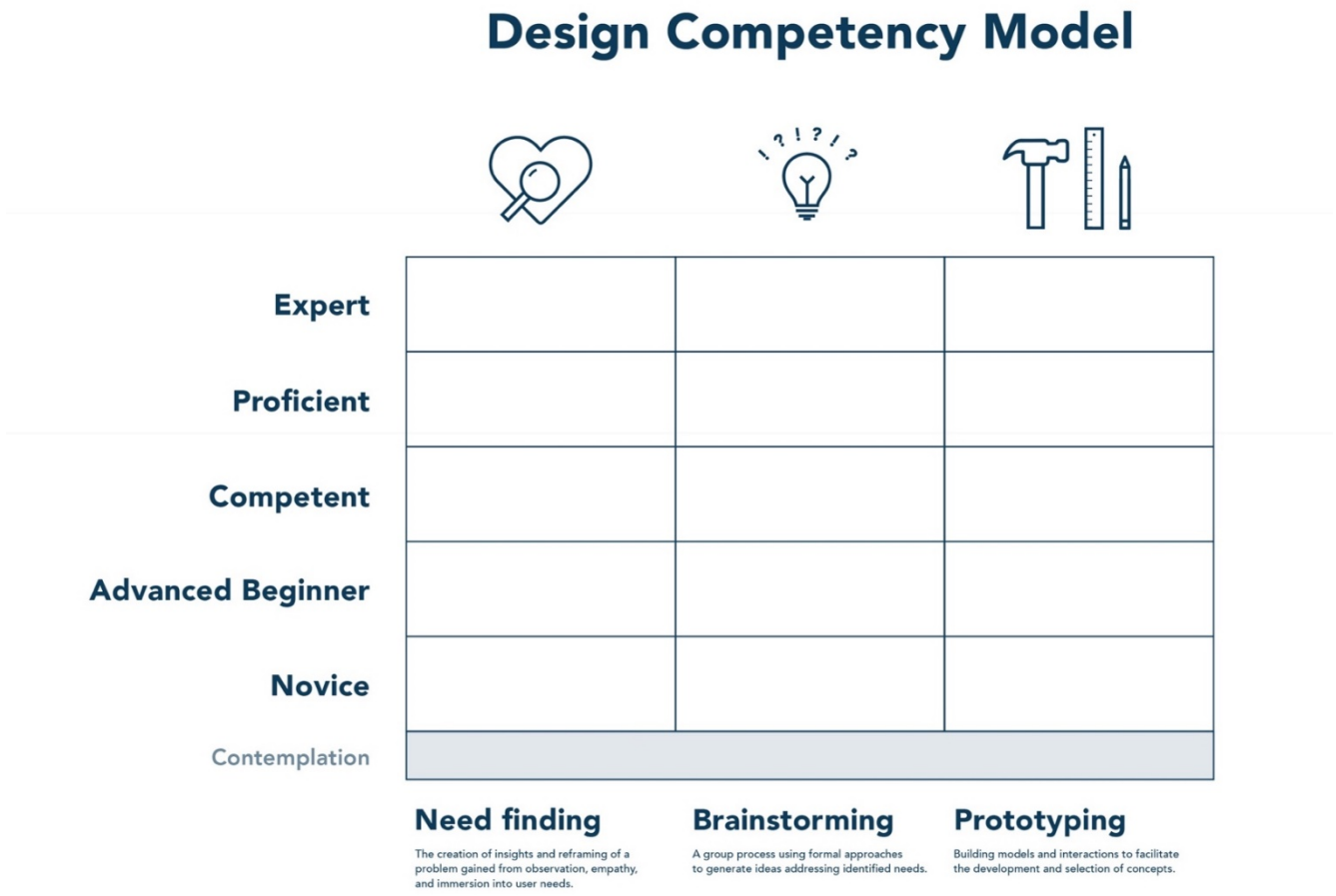


Figure 6.3: Design competency model

6.5 Explaining the model and the developmental stages

Before each stage of novice through expert is discussed, an overview of each stage and the way they are different and yet build upon each other is provided for context. The coaches in the study were considered to be in the final two stages of competency development, proficiency and expert, as they were fully comfortable with the methods and had accumulated years of experience as well as the ability to more easily and skilfully navigate complex situations. The learners, on the other hand, were beginning at either the contemplation or novice stage, and by the end of the programme, they were between novice and advanced beginner.

Next, each stage of competency development is discussed to provide more detail of each stage of development and to place it in context of the learners' and coaches' experiences as observed in the study. The review begins with the newly added stage, contemplation.

6.5.1 Contemplation

The contemplation stage does not exist in either the Dreyfus or Benner model and is not, therefore, shown in Figure 6.2. The contemplation stage is an enhancement to the existing models based on the findings of this study (Figure 6.3).

Contemplation represents the point when an individual is exposed to HCD, possibly through a conference, internal workshop, educational course, co-worker, or other source. During this time, it was observed that a person has enough exposure to begin to see the connection between their personal interest, a problem they have to solve, and the possibility of design as an approach to help. Yet, they are still contemplating whether to learn further. The learners at this phase were observed to be on a broad spectrum from mildly interested to highly interested and are looking for a relatively simple way to understand enough about HCD to determine whether it is a good fit for their needs and interests. They are frequently drawn to the idea of learning new approaches to solving problems because they are irritated by something in their environment that is not working, or they have found shortcomings in their current methods. In summary, individuals at this stage have a problem to be solved in their work or personal life and

are contemplating whether HCD is a potential approach to help lead them to a solution; they need enough exposure to it to make a determination.

6.5.2 Novice

Both Dreyfus and Benner began their models at the stage of novice. An example of a person at the novice level in a clinical setting is a nursing student. If observed, their behaviour in a practice setting is limited and inflexible as they have little or no experience and need clear rules to function in the work setting. Novices have limited ability to predict what might happen in a particular situation because of this lack of experience, and therefore, most activities seem difficult.

In this study, the novice HCD learners were provided with coaching to help make their work projects “more manageable” in scope and complexity, often meaning a project was deemed clearer, smaller, and with fewer risks. Coaches stated that this was because they needed simpler learning projects in order to put the focus of their efforts into practising and iterating the new techniques they were learning, rather than on the complexities inherent in large, high-risk projects.

Structures that make it easier for people to practice HCD were found to be important, such as easy access to patient advisory councils or protected time blocks for project work. The more the working environment supported the working styles and methods of HCD, the more likely and the more frequently the catalyst learners were to practice what they were learning. For example, access to the patient advisory council would likely lead to the catalyst team running more frequent sessions with the patients to understand their needs and to gather feedback on prototypes for more rapid experimentation of ideas. If catalysts have to recruit patients individually each time they want to speak to them, the extra effort required to do so would cause the learners to stall in their progress or to divert their efforts into working in more traditional ways that have less user involvement. Sponsor approval for time and resources during this learning stage is key to help enable the learners to put the time towards learning and practising and to provide “air cover” as the learners practice methods that are seen as unfamiliar or potentially “threatening” to the broader ways of working in the organisation.

Positive feedback from others at this point is important for the learners to feel progress and to continue the motivation to learn. They are building the desire to apply learnings into practice on a small scale, and the role of coach is important as a source of encouragement as well as to guide application of learnings for practical skill development. Learner confidence develops slowly with repetition and successful demonstrations of techniques over time, and a common and shared language helps provide a deeper and more focused discussion and reflection between the learners and the coaches.

6.5.3 Advanced beginner

New nursing school graduates are an example of advanced beginners, as stated in Benner's (1982, 2004) work. Nursing school graduates have more experience that enables them to recognise recurrent, meaningful components of a situation, as compared to nursing students, as an example. Advanced beginners have knowledge but not a great deal of in-depth experience.

The study of catalyst learners observed that the use of a few (usually two to five) select methods was becoming more comfortable, some of which they had used multiple times by that point. They were also more comfortable explaining what HCD is and how they use these methods.

The fluidity of speaking to and about the efforts in the new HCD "language" is growing at this stage, and they are more able to actively engage in peer-to-peer advice because of their experiences and their ability to talk about them coherently. They may begin to expand their use of HCD methods to similar, but new, areas of practice to grow both the context in which they apply their work and to continue to refine how they apply it and to what situation.

Still, the overall pattern of the ways HCD can be applied and what methods are ideal in which situations is not clear. Learners at this stage tend to resort to a few "go to" methods, regardless of the actual fit, as they struggle with a limited repertoire to apply in diverse situations.

6.5.4 Competent

The competent learners in the Dreyfus and Benner models are described as learners who are beginning to recognise patterns and situations more quickly than advanced beginners are, but they are not as quick and proficient in problem solving and acting as proficient nurses. Still, they can compensate with advanced planning and organisational skills because they have experiences to allow for more proactive planning to occur. So they behave competently as practitioners, but it still requires a great deal of mental effort on their part to do so.

This stage can be fraught with frustration as the learner is developing competency in their skills but is still likely to be in the stage of legitimising design skills to key advocates within their organisation. This may mean that as a learner, the mental effort to practice the methods is still high, and often the effort required to practice them within the organisation is also still high. This leaves some competent practitioners feeling frustrated and tired if the supportive organisational conditions are not in place by this point. Need finding and brainstorming approaches are often more frequent in their practice development, but a holistic approach to synthesis and problem reframing, as well as creating a breadth of prototypes for user input, was observed as lagging behind and occurring less frequently.

The competent learners in this study saw themselves more in a role of growing as practitioners of HCD than they did as new learners. This means that they identified more with those who are proficient or expert HCD practitioners than they did with new learners. Because of that, some people at this level of growth sought peers for their growth and to share thoughts and ideas with.

These individuals were looked to in their organisations to plan and run work sessions and projects independently. Typically, their work came across very positively. However, competent learners are not able to adjust the HCD approaches significantly based on the audience and the context, as their skills are not nimble enough yet. At this stage, what is shared with others is more based around the abilities of the competent practitioner than the needs of the participants.

The competent learners, which included some of the coaches, no longer needed a coach for the everyday issues or for the basics of their HCD practice, but they still relied on a coach for unusual circumstances or what they viewed as complicated or involving new contexts.

6.5.5 Proficient

According to the Dreyfus and Benner models, situations for proficient learners can be viewed as a whole rather than in parts. This is important because it means that the mental energy required reduces; as each element of a situation does not take an entire thought process and plan, the proficient learner can view it as a whole and identify and prioritise the needs overall, although still through a more rational, as opposed to an intuitive, approach. Proficient nurses can learn from experience what events typically occur in order to anticipate next steps more easily. They can respond quickly and modify plans in response to the situation when needed.

In this longitudinal study, all the individuals at this level of performance were serving in coaching roles. It was observed that the learner who reaches the level of proficient typically has internal organisational advocates and has often built a team of people who are attempting to model their design methods and skills. They have determined to reconcile the similarities and differences between design methods and other approaches like Lean and Six Sigma. Therefore, they pull from multiple approaches and methods with more ease than those in earlier learning categories. They can also speak to and advocate for the use of various approaches when appropriate. While infrequent, they still need coaching at this stage, particularly when the work is complex or high risk. However, overall they are very comfortable and skilled at practising in a wide range of settings, with a wide range of approaches, and can adjust based on the context in which they are practising.

6.5.6 Expert

The experts described in the Benner and Dreyfus models no longer rely on rules to guide their actions. They have an intuitive grasp of the situation and can rely on their deep knowledge and expertise as they adjust and change as needed. Experts are clear and confident about which problems require their attention and which do not, as their

experience has helped them develop an ability to sort through complex situations. They typically only use analytical tools or guidance from other people for support when they do not have experience in an event or when events do not occur as expected.

This study had similar findings of the exemplar change agents. It found that exemplars in design methods at this stage have also often created an internal following of people, advocates and team members, who evangelise the use of design methods with them in their organisation. As found in Benner's and Dreyfus' work, experts can improvise methods in the moment based on what is needed. They can also contribute new knowledge and approaches to continue to grow HCD as a practice. They have often formed a sustainable microclimate around themselves and their partners and have a thriving network both in and out of their organisation (Zuber and Moody 2016).

The HCD experts did express some frustration in coaching the new learners in the programme, as they received what they expressed as "a lot of questions about change management". They found this frustrating because when they agreed to be a coach, it was because they were needed for their "expertise in design, not in change". There was a great deal of discussion among the coaches about how to coach the teams and provide guidance for them versus providing more of a consulting model where the coaches gave expertise-based recommendations and modelling to the learners. It was notable that while the individual experts were seen to have the technical competency in HCD at this stage, they did not necessarily understand or have expertise in the skillsets needed to behave as a coach for organisational change issues. Some of the coaches had this understanding, but it was not universal.

These stages viewed together demonstrate an evolution in the thinking process and approaches of HCD learners and the way the Dreyfus and Benner models, with refinement, are relevant to design within this context.

6.6 Discussion

This study sought to understand the individual experiences of those on a journey of learning and applying HCD skills within the context of healthcare organisations. Alongside the findings from Chapters 4 and 5, this chapter has allowed the formation of

propositions on the end-to-end learning experience and application of HCD within an organisational context and enabled the development of a design competency model.

In the following section, enablers are expressed followed by a discussion of three higher level themes from this study that appear to underlie the catalyst learners' experiences: organisational culture as context, right sizing the learning approach, and a discussion of the design competency model. Taken together, these three areas capture the changes in the learner over time in the context of where the learning occurs.

6.7 Enablers for learners within a healthcare environment

Detailed analysis led to a set of eight insights that new learners and their coaches expressed through observations and during discussions. This set of enablers aid the learning and application journey in the workplace.

The enablers identified during the longitudinal study are:

- Support of advocates for permission and to secure resources;
- Role of partners for encouragement and momentum;
- Trust and play within the team;
- Use of design methods with other approaches known within the organisation;
- Connection with users and needs of patients;
- Sharing in stories verbally and demonstrating empathy;
- Rapid learning cycles to build experience through smaller and less visible projects;
- Small and frequent tests with users.

These individual enablers, when viewed as a whole, are discussed as organisational culture as context, right sizing the learning approach, and learning over time. They suggest that learners developed the enablers in response to the organisational culture

so they are able to continue to build support. Advocates, partners, and the flexible use of methods and approaches help them achieve this support through a legitimisation of the HCD methodology (Rauth, Carlgren, and Elmquist 2014), as does an empathetic connection with users and patients that is expressed through compelling storytelling (Lin et al. 2011; Martins and Terblanche 2003; Neuwirth et al. 2012). Right sizing of the learning approach occurs through the rapid learning cycles and small and frequent tests with users (Edmondson 2008; Fogg 2009; Kelley and Kelley 2012; Langley et al. 2009; Liedtka, King, and Bennett 2013), which is supported by a playful and trusting work environment (Amabile et al. 2005; Amabile and Kramer 2011; Covey and Link 2012; Edmondson and Lei 2014). Finally, learning over time, as interpreted in this work, has led to the development of a model that supports the stages of learning within the context of the work environment.

6.7.1 Organisational culture as context

There were a few key observations about organisational culture as a context, which relate back to the HCD learning and application journey. The importance of the context in which new learners attempt to learn and apply their new skills is apparent (Carlgren, Elmquist, and Rauth 2014; Carlgren, Rauth, and Elmquist 2016a, 2016b), and this was demonstrated in this study in a few specific areas such as the ability to access users/patients for the work, the conditions created by the advocates, the catalysts' partners and coaches, and the ability to conduct rapid experiments in an environment that felt safe to take risks. The learners in this research were studied within the actual context of their work environment; they were both learning the methods and exposing their own organisation to the methods, often for the first time. Neither Kolb (1984) nor Dewey (1938) in their work on learning focus on the context of learning. Therefore, in their omission it could be assumed that environment plays an arbitrary or neutral role in the development. The learner either learns independently of the environment (the environment is irrelevant), or it assumes that the environment is supportive or desires the skills the learner is developing. This was found to be an important omission in the work of these new learners. Context of the organisation and what it provides to enable, or hinder, learning is critical.

The importance of the context in which new learners attempt to learn and apply their new skills (Benner 1982, 2004; Carlgren 2013a; Chang and Rieple 2013) resonated in this study. This study highlights how HCD as an approach is received within an organisation and the environmental context in which it occurs. Design literature to date has primarily focused on what HCD *is* (Liedtka, King, and Bennett 2013; Martin 2009) and how it can be *applied* (Brown 2008), but little has focused on what it becomes within an organisation (Carlgren 2013a; Carlgren, Elmquist, and Rauth 2016a, 2016b) and even less research has focused on the detailed interactions between the individual learner and the organisation during the internalisation of design.

6.7.2 Right sizing the learning approach

The new learners expressed significant frustration at the beginning of their programme as they struggled to both learn the new HCD methods and create environments in which to use them. Two primary challenges occurred in this dynamic: the loss of a learning environment to build skills and confidence (Bandura 1989; Edmondson 2008; Fogg 2009; Kelley and Kelley 2013) and the loss of perceived progress (Amabile and Pratt 2016). As well, the potential loss of engagement in the learning experience overall was observed in a small number of the learners.

To extend our understanding of the HCD learner, the longitudinal study of the Catalyst programme demonstrates that some individuals express frustration if they, or their sponsor, believe that their project work or their learning is not moving forward. This is in line with learning theory and the needs for self-efficacy (Bandura 1989; Kelley and Kelley 2013) and a sense of progress (Amabile and Pratt 2016). At the other end of the spectrum, learners who have supportive environments, such as active advocates and coaches, well-scoped project work, and reasonably easy access to resources such as patient councils, tend to remain engaged per the coaches' experiences. According to the coaches, they appear to use their time and energy to learn and to move the work forward. This has a positive reinforcing effect in that their advocates provide them with more resources and encouragement.

The learners' challenges in applying the methods were most evident in efforts they regarded as "risky" within their organisation, including instances when the learners deviated from the project scope set by project sponsors, or testing out early-stage ideas

with their peers and patients in the live care setting. The psychological safety literature highlights the importance a person's perceptions of the consequences of taking a "risk" in a context; the more risk perceived the less psychologically safe the environment is perceived (Edmondson and Lei 2014). The presence of psychological safety is a critical factor in learning (Edmondson and Lei 2014), and this is evident in the difference expressed between the catalyst teams. An additional element to this risk is higher likelihood of making mistakes in the beginning of a learning experience, so it is important that the context for the learner is considered and the learning activities are more structured and repeatable for new learners (Dreyfus 2004; Dreyfus and Dreyfus 1980). "Rules-based" approaches echo this need and provide a solid approach to learn at a reasonable pace with a higher likelihood of success (Benner 1982, 2004; Michie et al. 2008; Michie, van Stralen, and West 2011; Fogg and Hreha 2010).

6.7.3 Learning over time and model development

The study observed changes in the learners over time, which were shared with the learners and coaches in the study. Models of learning that establish learning through direct application and practice have similarities to the learning approach found in this study. The role of experience in learning has been heavily studied (Beckman and Barry 2007; Benner 2004; Seidel and Fixson 2012), but HCD learners within an organisational setting has not (Carlgren 2013a; Carlgren, Elmquist, and Rauth 2016a; Seidel and Fixson 2012). It has been proposed that learning occurs as new experiences are compared and contrasted with old experiences to continuously learn and adapt (Dewey 1938), and the coaching calls with learners and the peer-to-peer discussions provided a platform for the catalysts to reflect and learn together. As the months passed, their questions and advice became more in depth, sometimes weaving together the HCD methods with other methods and the cultural context. The literature in HCD has discussed the phases of design in a project (Brown 2008; Liedtka 2015) and the phases of organisational legitimacy (Rauth, Carlgren, and Elmquist 2014) but not the stages of learning HCD, and thus, the potential application of learning stages to HCD is new.

This study has begun to reframe learning and application of HCD into stages, developed as a design competency model that could potentially be used to create more nuanced learning programmes or learner competency evaluations. It also provides insights into

the experiences and needs of the HCD learner to allow leaders to provide better advocacy for the efforts. The potential implications of the design competency model with the microclimate model as a way to empower organisational leaders to develop workforce innovation is discussed in Chapter 7, Development of Theoretical Models and a Learning Framework.

6.8 Study limitations

Although the participants in the programme represent a cross-section of healthcare roles and entities, it could still be argued that the effects of them all being trained in the same programme emphasises the attributes and shortcomings of the programme as much as it does the individuals. Additionally, the researcher has intimate knowledge of the programme and therefore is at risk of researcher bias. This bias was minimised by including active user feedback in the insights created and in the framework development, discussed in more detail in Chapter 7.

It is also too early in the catalysts' journey to determine who, if any, will eventually become experts in the design space. It would be of interest to follow the learners many years into the process and retroactively review the data to identify potential early indicators of success that were identified in this study. Development of a learning curriculum using the design competency model would be an area of interest to test whether it could be actively applied to evaluate and coach learners as they attempt to progress in their practice.

Finally, in serving as a researcher on calls and in person at the exercises, there needed to be a recognition of the potential effects that could have on the participants because of the researcher's viewed standing in the innovation and design literature and field. A few key approaches were taken, including undertaking multiple studies to aid in triangulation and the expression of multiple points of view of participants and organisations that were considered independent and had no reporting relationship to the recruiter.

6.9 Chapter conclusion

This longitudinal study examined the individual learning and application of HCD in large, complex organisations over a period of 12 months. The perspective of an individual

learning journey is novel, and the study offers a not-often-seen view of the learning and application of HCD within an organisational context (Beckman and Barry 2007; Seidel and Fixson 2012). To date, this has been explored to some extent by interviews with experts as they reflect on their changes in practice over time (Carlgren 2013a; Carlgren, Elmquist, and Rauth 2014; Carlgren, Elmquist, and Rauth 2016b; Liedtka and Ogilvie 2011; Rauth 2015). The approach applied here reveals that learning HCD skills may occur in a series of developing stages and is influenced by the context in which it is being learned.

The contradiction in this study is that the learner is learning skills and approaches to be a champion or a catalyst for change. This inherently implies that they are behaving and working in ways that are not the norm for the environment, and in this case, the organisation in which whey work. Therefore, the learner's journey cannot be removed from the environment. On the contrary, both need to be considered together, and the interaction of the two need to be accounted for.

This thinking was extended further into a design competency model for the individual learner and within the context of their learning environment. This model was developed with users in co-design sessions to refine the content and enhance the usefulness of the PhD thesis output within organisations.

The next chapter pulls together the emerging competency and microclimate models and further discusses the development of the models and a supporting framework for implementation.

Chapter 7: Development of theoretical models and a learning framework

7.1 Introduction

This chapter aims to draw together the findings from Chapters 4, 5, and 6 and provide a summary of some of the key contributions of the thesis. Having described three studies that explored experiences of learning and applying HCD, and mapped key supportive conditions and behaviours for individuals to successfully apply HCD for innovation, this chapter takes those findings and applies them to finalising

- a theoretical microclimate model, which defines the necessary components for successful application of HCD methods for innovation in large organisations;
- an implementation roadmap for the microclimate model to provide a practical path for leaders of change to develop their own microclimate for innovation within the workforce;
- a new design competency model that proposes stages of learning HCD methods for innovation by multidisciplinary teams.

The three studies presented in this research provide views of the experiences in leading innovation and change along a spectrum, ranging from those who have not received any developmental support in learning HCD or innovation approaches to novice learners through to those who are considered exemplars and have developed and sustained this capability within a diverse range of organisations. The participants contributed viewpoints that encompass healthcare organisations as well as extend more broadly across non-healthcare settings and industries. The evidence built in prior chapters has led to a set of models that have been iterated through co-design sessions and member and peer checking, together referred to as “user feedback”.

Iterative feedback sessions were held with practitioners and academics involved in the studies to result in two novel models and a roadmap to support their implementation.

These were shared and co-designed with potential users throughout the user workshops and subsequently, shared during nine different academic and business conference presentations for real-time reactions and commentary. This ensured that as the models were developed and refined, they best reflected a wide range of practical experience. Open discussion and co-design sessions helped provide clarity of user needs, develop common frameworks, and ultimately, create an approach to guide the learning and application of HCD within organisations, which is supported by users and impactful in the healthcare industry.

The final versions of the models are presented, as well as a framework to support the implementation of the microclimate model called the microclimate implementation roadmap (see Figures 7.1 to 7.8).

Each theoretical model is explained and a description given of how the models could be used by three different categories of users: (1) an educator or other individual such as a coach/mentor who is attempting to develop the HCD competency in other people, (2) an organisation leader or change agent aiding in a supportive environment for the changes, and (3) an individual learner and/or their team as they seek to understand the individual and team current state and future goals. While not intended to be an exhaustive description, the “aspirations” show the use of the models, and the framework demonstrates how their use connects and builds into a systems approach.

7.2 Conditions enabling HCD

To consolidate the output of these diverse studies, this chapter begins by drawing together results across studies relating to the identification of enablers of HCD. Comparisons are then made between the outputs of the three studies.

The research sought to identify the conditions and behaviours that enable individuals to successfully apply HCD for innovation. The experiences of those seeking to lead innovation and change, but without the benefit of organisational training, were discussed in Chapter 4. These were built upon with findings identified through a study of experts examined in Chapter 5. Finally, the insights gathered over 12 months of observations from learners and their coaches within healthcare organisations further developed our understanding. The findings across studies are mapped together in Table 7.1.

It is clear that reinforcing patterns have emerged from the three studies. To begin, all three studies point to the need for enabling conditions, starting with an advocate to protect a developing team from the pervasive organisational culture and to provide a basis of resources. Additionally, a partner proved to be an important element for the learning experience and to provide day-to-day support and encouragement in what was described as a challenging role due to its counter-culture approach. The feeling of psychological safety demonstrated by a playful and trusting environment could be used to signal the health of the work environment within the team. The behaviours were aligned across all three studies, although the words to describe them may differ. The behaviours included connecting to the needs of people, making ideas real or "scaffolding" them, and sharing stories.

Learning through slow but progressing development of capabilities over time was seen in real time in the study of the catalyst learners and of the exemplars, but not in the study of individuals who had not received any training on innovation or design methodologies. These untrained individuals in HCD, the nurses, captured the enablers of championing innovation and change, perhaps because this group did not identify themselves as skilled in innovation or design, and they had not received any training on the topic. All other categories of insights aligned and were comparable across all three studies, showing a strong correlation between the deeper needs of those who have led innovation and for HCD with those who are at various stages of learning how to do so.

Table 7.1: Comparison of enablers identified across the three studies

Enablers identified by novices outside of organisational context (Chapter 4)	**Enablers identified by exemplars (change agents) across organisations (Chapter 5)**	**Enablers identified by a spectrum of learners within healthcare organisations (Chapter 6)**
Clarity of goals and control of resources	Secure an advocate to allow working differently than the predominate organisational culture	**Sponsors or advocates** were needed to **provide permission and secure resources**. **Coaches** were needed to **provide guidance** on interaction between developing HCD skills and navigating the context within the organisation.
Positive encouragement and confidence	Develop a close work partner for emotional support and learning development	The coaches noted the slowdown in progress and excitement for the catalysts who lost their learning partner during the programme. The coaches described the **difficulty for one person** to keep the momentum going in an environment that was unfamiliar with the HCD methods.
Psychological safety	Create a playful and trusting workplace for teammates	There appeared to be a potential **correlation between** those who were more **playful** on calls, even during challenging times, **with those who made more progress** on the project efforts and believed that they **had support** to keep going.

(No comparison insight)	Improvise methods; adjust approaches and mix together methods of design with others when needed	New learners appeared to be **lacking the experience to deviate from the few HCD approaches** they had learned and **to integrate other techniques such as Lean and change management together with HCD**. Towards the end of the programme, these phenomena began to change.
Personal need for a solution	Display a deep curiosity and commitment to people	Catalysts voiced how the methods helped them better **connect with and understand the needs of the patients** they served as **well as the personal needs of the staff** in their workplace.
Challenges that have a meaningful purpose	Tell stories; share experiences and work verbally and physically	**Sharing stories** verbally was strongly supported by the **empathy** exercises they learned. Sharing these stories noticeably reinforced their **motivation and purpose** and the positive perception that others had of them.
Experiencing progress quickly and visibly	Learning as behavioural change and building of capabilities	The coaches expressed a desire for the catalysts to join the programme with a smaller and “less visible” organisational project that they could use to learn to apply the HCD skills **for encouraging momentum and learning cycles.**
Active experimentation	Build tangible “scaffolding” of ideas to get the work started and to refine and reflect along the way	Making ideas more real through **small and frequent tests with the users** was emphasised by the coaches from the first day of training and all the way through the programme.

7.3 Extending these findings and models to leadership actions

It has been noted in the research that the role of the change agent or organisational leader is paramount in bringing HCD capabilities into organisations. It has been demonstrated that HCD provides an active approach to influencing organisational efforts towards innovation, and that it is a potential path for the workforce and leaders to begin to address healthcare challenges. In Table 7.2, a range of additional HCD tools and methods are mapped against enablers and leadership actions with the aim of providing the beginnings of a roadmap towards active experimentation and eventually implementation of HCD within the workforce.

For the organisational leader, these approaches may feel somewhat different from the approaches they have traditionally used. Learning to lead for creativity and innovation may feel uncomfortable at first, but those who have taken the path of HCD for innovation have a great deal to share and offer, as demonstrated in this research. There are active online and in-person fora where healthcare leaders connect about innovation and design, and the momentum within healthcare is building. Transformational leaders can feel the same empowerment of a collaborative human-centred approach to innovation as their front-line staff, while they learn and experience it together.

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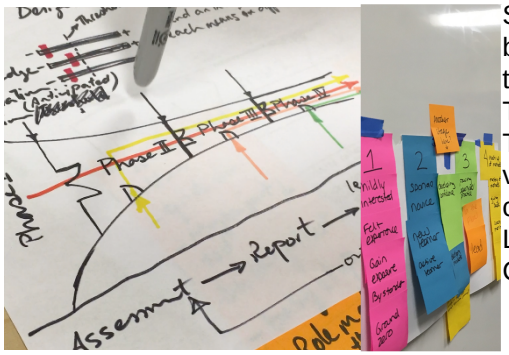
The discussion now transitions to the models and roadmap. First, the design competency model is featured. The study of non-designers who had not been exposed to HCD or innovation approaches provided an open-ended view of the enablers for championing innovation and change, while the study of exemplars captured those on the other end of the spectrum who are highly skilled and have experience developing those approaches within a cross-industry workforce. The longitudinal study added a more dynamic view of the learner by demonstrating how the learning needs and approach may change over time within the context of healthcare. These insights were leveraged from the learning stage work of Dreyfus (Dreyfus 2004; Dreyfus and Dreyfus 1980) and Benner (1982, 2004) and formalised in a design competency model.

7.4 The design competency model

HCD in organisations has focused on what is to be taught and learned as an innovation capability, but not how to best learn it (Carlgren 2013a; Carlgren, Elmquist, and Rauth 2014). This study reveals that learners go through stages over time, one stage building upon the other (Benner 1982, 2004; Dreyfus 2004; Dreyfus and Dreyfus 1980). The skill-building models of Benner and Dreyfus were developed from studies of chess players, fighter pilots, and nurses, each with a development trajectory to expertise. The developmental nature of these individuals resonated with the experiences of the participants within this body of research. The development of the model is detailed in Figure 7.1, with the final model illustrated in Figure 7.2. The explanation of the various elements of the design competency model was discussed in Chapter 6, Section 6.5.



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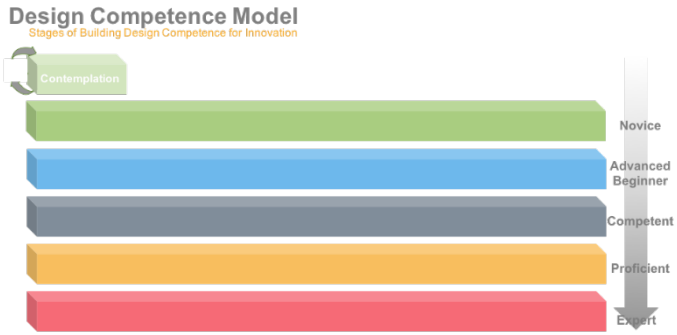
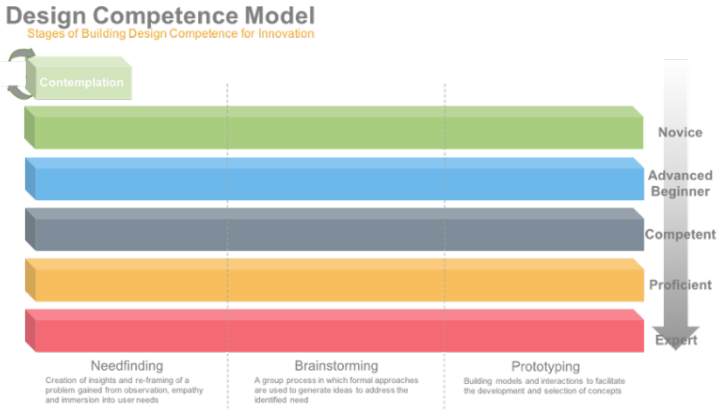
A review of insights from the empirical research led to the creation of a range of draft prototype models. **Users began to provide feedback on the draft models** and drew additional models of their own. The primary insight from the sessions was the need to show phases and steps to learning and to demonstrate it in the context of how and where the learning was occurring.

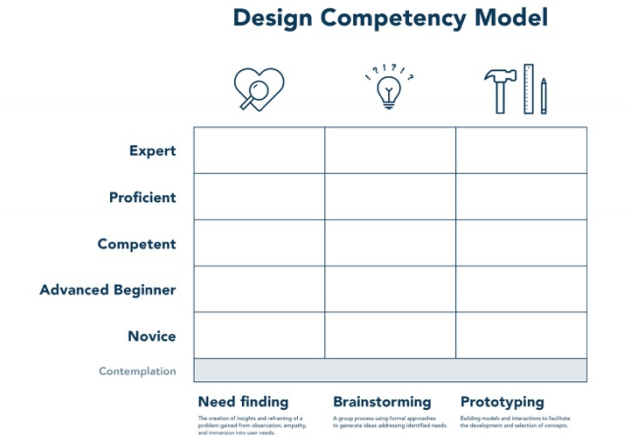


After additional literature on stages and context of learning was reviewed, a direction was selected. The **basic components** were captured in a more formal model **based on models by Dreyfus and Benner.** When used in this context, it shows that HCD could have the same five phases.

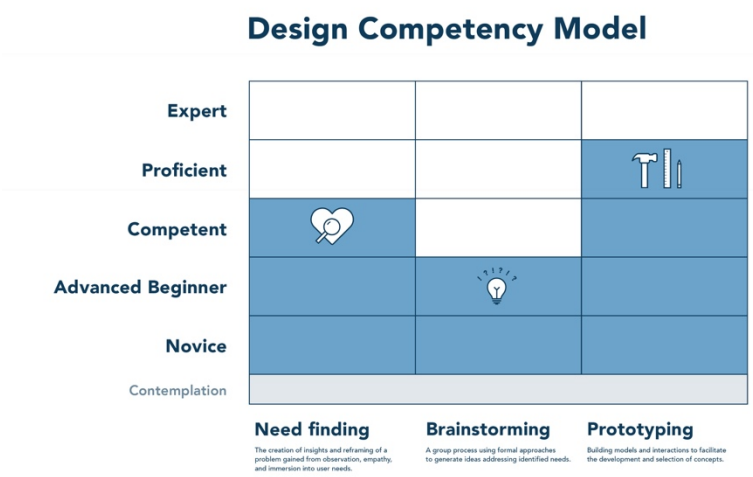
Unlike the nursing field, where Benner's work occurred, many of the HCD learners did not have a clear job requirement for the skills. They expressed its impact on how learners go through a phase before they begin a learning journey. Therefore, a **contemplation stage was added;** that is, when users frame the need to "try it out" before they understand it, they commit to becoming a learner or support others to learn.



It was observed and acknowledged that learning **does not progress evenly through the stages,** and that it may occur more quickly in some areas than others. **Need finding, brainstorming, and prototyping** were added as they are commonly referred to in these segments of HCD literature (Brown 2009; Lockwood 2010; Martin 2009; Seidel and Fixson 2013).



A **final version** of the design competency model was created using the same content as the above, but it is more fully designed visually to improve its ease of use.



Example showing the design competency model being used as an **assessment of an individual level of competency**.

In the example provided here, the learner has reviewed a description of the stages of development and has placed their ability to practice HCD in the novice category for need finding, the competent category for brainstorming, and has placed themselves as an advanced beginner for their grasp of prototyping methodologies.

Figure 7.1: Evolution of design competency model

The evolution of the model demonstrates the addition of a contemplation stage as well as a division of method development into three categories—need finding, brainstorming, and prototyping—that can develop at different rates for different learners. The users expressed their sentiment about the model throughout the process.

Feedback was gathered from participants who attended the co-design sessions. Two different high-level rounds were shared, one for the initial feedback sessions that included very diverse models to understand what was compelling to people and why. The subsequent rounds of feedback focused on refinement of the model presented and any additional output that was deemed missing.

The first round of feedback was in response to reviewing eight different model possibilities, showing information in vastly different ways to spur dialogue and uncover needs. Participants' comments included discussion such as:

> It's rare that I see organizations start from the top. The way I've always seen it, in reality, is that it starts with the individuals. So it would be interesting to show an organization a map of sorts that allowed them to say hey [organisation name] where is it that you see yourself and how do you build this up within the organization? (Catalyst coach)

> I like the [name of a prototype shown during a co-design session] the best because it's a roadmap, a description of how to put this together. I love it love it love it. People want a guide. They want to know what they will be doing. (Catalyst coach)

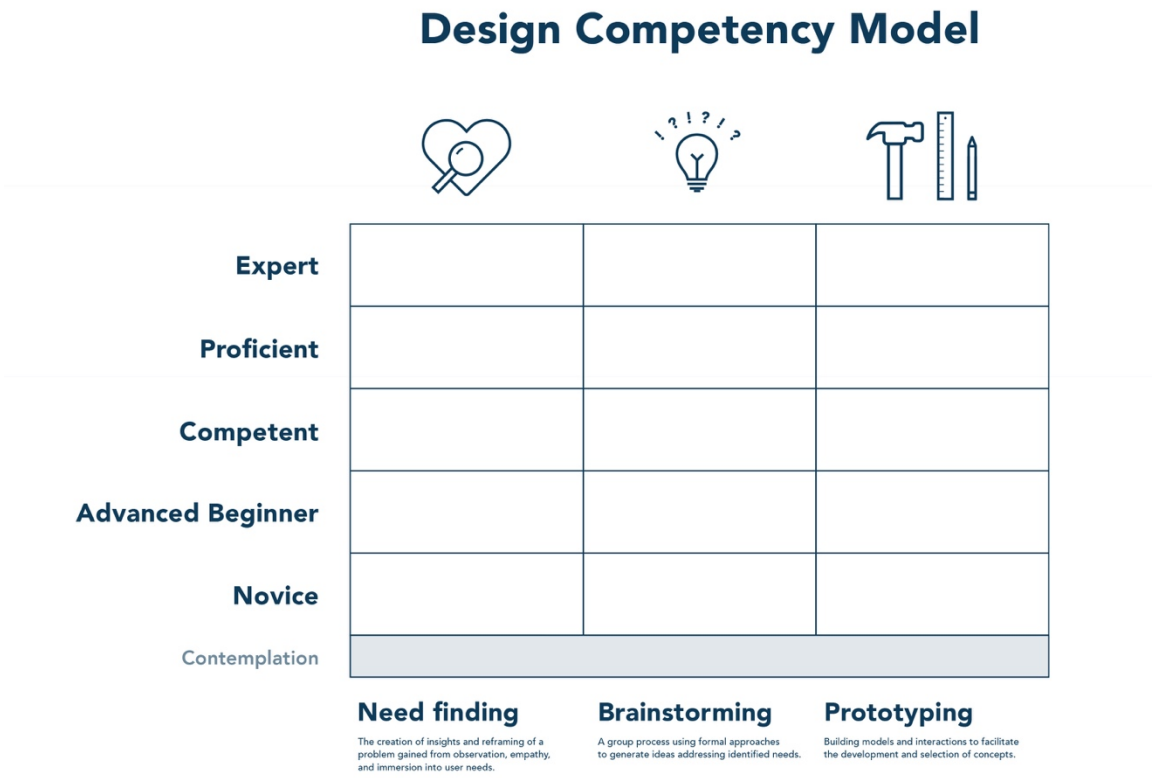


Figure 7.2: Design competency model

The design competency model, as developed and discussed in Chapter 6, built on the initial work of Dreyfus and Dreyfus (1980) and Benner (1984) and modelled how people acquire skill though formal instruction and practice. Their research positioned learning in the context of the place where it is applied, such as the workplace, and acknowledged the formal instruction and modelling that is a part of the learning experience. The stages of learning as seen above—novice, advanced beginner, competent, proficient, and expert—offer a new view of HCD that postulates that it, too, occurs in stages. There are two additional components added to the original models. The first component added to the Dreyfus and Benner models is a contemplation stage, at which a learner or leader is being exposed to HCD and is formulating whether or not to begin the actual learning journey for themselves or their workforce. Additionally, the three segments of need finding, brainstorming, and prototyping were added by the users to better represent what they believed to be the core methods within HCD that learners progress through. They were called out separately because the user feedback suggested that learners progress

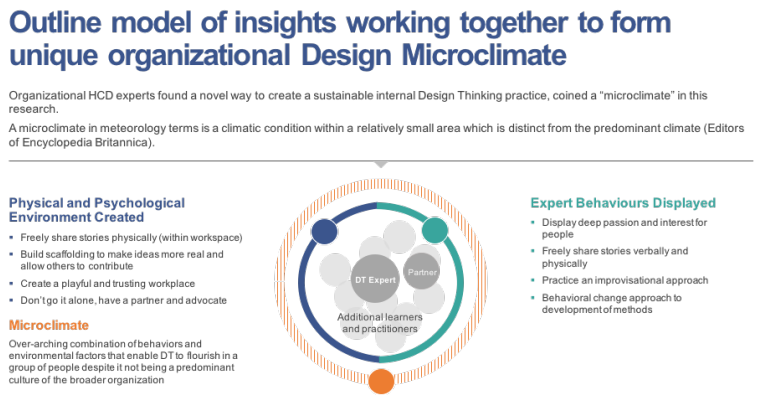
through them at different rates, and this was an important nuance in fine-tuning the tool and specific for individual and team learning and assessments, as well as the development of curriculum.

7.5 The microclimate model

An iterative development process was also employed to develop the microclimate model. It was initially presented as a result of the findings in Chapter 4. The development of the models continued, iterated by individuals across the learning and expertise spectrum via conferences and events attended by the author. They reflected on how environments were created to allow HCD for innovation to be successfully applied within large organisations. The need for a view of the context of the learning is captured by this catalyst learner:

> My favorite quote I've heard from others is 'human-centered design is easy to learn but hard to do.' People get it, but to do it in an organization [pauses] well, that's the hard part. (Catalyst learner)

The images in Figure 7.3 capture the development and components of the models that focus more on the context of the environments needed to support the application of HCD for innovation. This occurred through several iterations resulting in the final microclimate model in Figure 7.4. The components of the microclimate model were discussed in detail in Chapter 5, Section 5.3.

Some materials have been removed from this thesis due to Third Party Copyright. The unabridged version of the thesis can be viewed at the Lanchester Library, Coventry University.	Workshop participants reviewing the multiple sketch models provided for feedback in initial sessions.
	Based on the feedback, the **initial microclimate model** was developed to show the path of **experts.**

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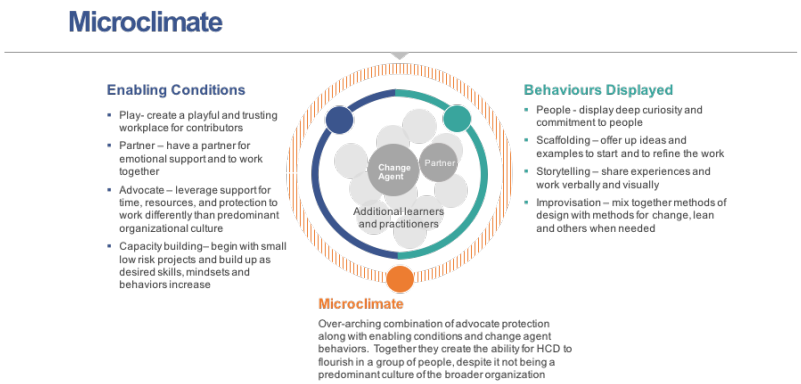
<td> 
</td>
<td>The term expert was deemed confusing in the development of the design competency model, as not all change agents are experts in the HCD methods. They were more recognised for their ability to develop this practice within a workforce; thus, it was replaced with the term change agent.

The categories were abbreviated for clarity and ease of reading. Exemplars expressed that the model resonated with their experiences, and new learners were interested in the model for their personal development.</td>
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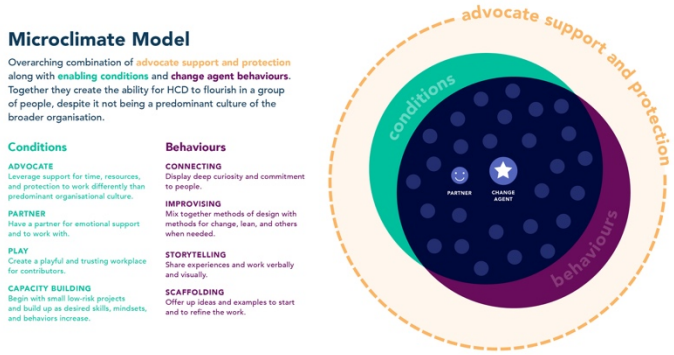
<td> 
</td>
<td>Final version of the microclimate model with the same content as the above but more fully designed, visually.</td>
</tr>
</table>

Figure 7.3: Evolution of the microclimate model

Microclimate Model

Overarching combination of **advocate support and protection** along with **enabling conditions** and **change agent behaviours**. Together they create the ability for HCD to flourish in a group of people, despite it not being a predominant culture of the broader organisation.

Conditions

ADVOCATE
Leverage support for time, resources, and protection to work differently than predominant organisational culture.

PARTNER
Have a partner for emotional support and to work with.

PLAY
Create a playful and trusting workplace for contributors.

CAPACITY BUILDING
Begin with small low-risk projects and build up as desired skills, mindsets, and behaviors increase.

Behaviours

CONNECTING
Display deep curiosity and commitment to people.

IMPROVISING
Mix together methods of design with methods for change, lean, and others when needed.

STORYTELLING
Share experiences and work verbally and visually.

SCAFFOLDING
Offer up ideas and examples to start and to refine the work.

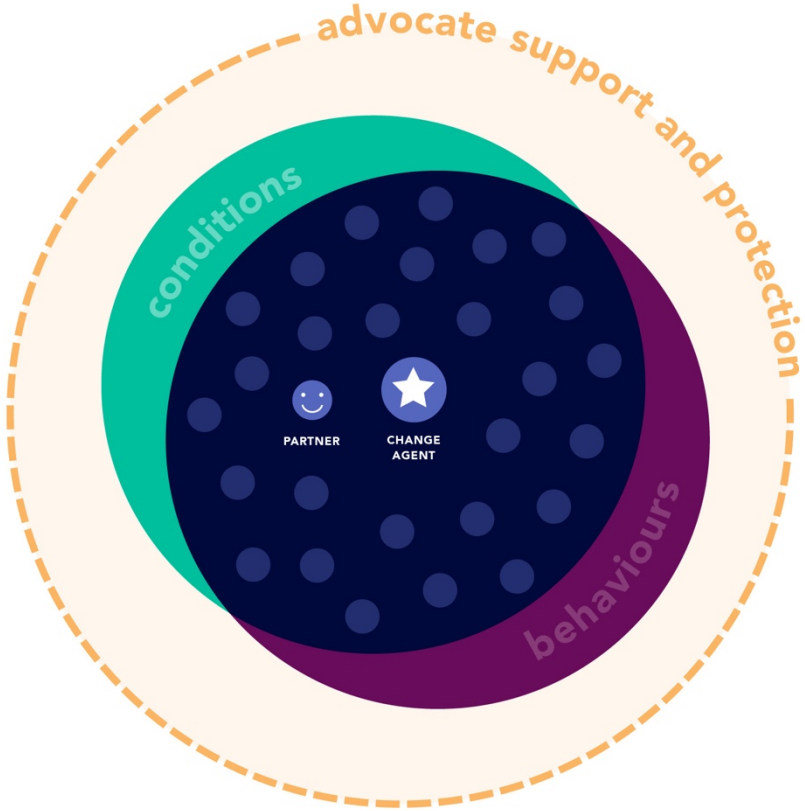


Figure 7.4: Microclimate model

As seen in the development of the model (Figure 7.3), the output went through several stages of iteration until the final model was deemed representative of the experts' experiences. The final microclimate model provides the common enablers identified by cross-industry expert practitioners. Four key conditions and four key behaviours surfaced during the thematic analysis: advocate, partner, play, capability building, connecting, improvising, storytelling, and scaffolding. These begin to serve as a useful approach to others who are looking to lead the application of HCD for innovation within their workplace. This model can be used either to assess their current state to determine what components are strong versus components that may be missing, or it can be used as a discussion guide for those leading the endeavour to create a common vision and understanding of how they can better lead these efforts. This model takes experiences and disparate parts of knowledge, placing them into a set of repeatable heuristics that can increase the likelihood of mirroring the experts' success.

The users echoed this sentiment. They stated that viewing the surrounding context as a microclimate resonated with them, making it easier to repeat and speed up the process of creating more microclimates within and across their organisations, being clearer about how to replicate it. This would also allow change and innovation driven through HCD to move more quickly.

Another area of feedback was of how to better activate the microclimate model. This quotation is representative of the feedback sentiment:

> The microclimate model is useful to me. I can see its use immediately. But it needs a better descriptor and to be explicitly stated how to use it. To make it more specific and actionable. How does it develop? I'd like more guidance on how to apply it. (Practitioner in large organisation)

A companion piece was created for the microclimate model to help with its implementation. Section 7.6 discusses its development and the final output.

7.6 Microclimate implementation roadmap

The development of the roadmap was a result of direct feedback stating the need for more clarity and direction to use the microclimate model. It was iterated with the same participants as were involved in the design competency model. Quotations such as this

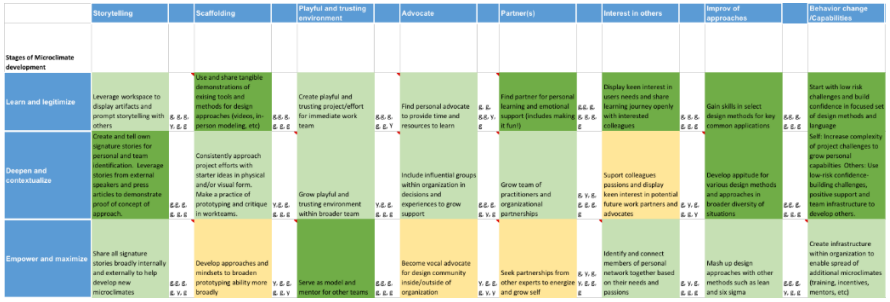
provided the guidance to create specific stages for each microclimate component that could be followed:

> People will want a guide for how to do this in their own organizations and how to develop themselves and others. Where do I start, where am I going and how do I get there? For example, do you start out responding to the context like developing an advocate, partner, mentors/peers to guide? (Practitioner in large organisation)

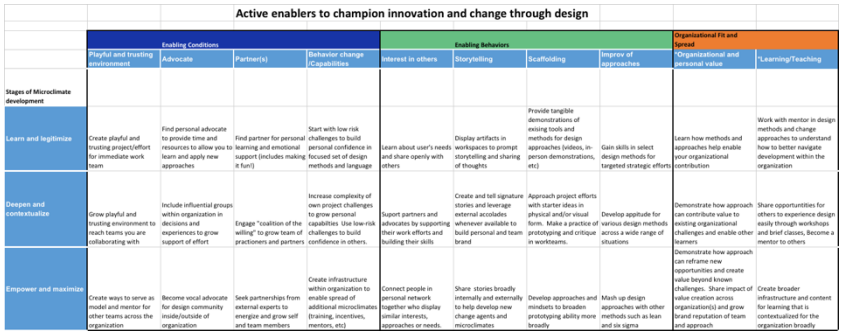
To address this need, the transcriptions were reviewed and the thematic coding was noted with the idea of implementation in mind. The result was a microclimate implementation roadmap ("roadmap"), which was developed through a co-design approach. Images of the development through iterations are shown in Figure 7.5 and each component is shown in its final state in Figures 7.6 through 7.8.

	Active enablers to champion innovation and change through design							
	Storytelling	Scaffolding	Playful and trusting environment	Advocate	Partner(s)	Interest in others	Improv of approaches	Behavior change /Capabilities
Stages of Microclimate development								
Learn and legitimize	Leverage workspace to display artifacts and prompt storytelling with others	Use and share tangible demonstrations of exising tools and methods for design approaches (videos, in-person modeling, etc)	Create playful and trusting project/effort for immediate work team	Find personal advocate to provide time and resources to learn	Find partner for personal learning and emotional support (includes making it fun!)	Display keen interest in users needs and share learning journey openly with interested colleagues	Gain skills in select design methods for key common applications	Start with low risk challenges and build confidence in focused set of design methods and language
Deepen and contextualize	Create and tell own signature stories for personal and team identification. Leverage stories from external speakers and press articles to demonstrate proof of concept of approach.	Consistently approach project efforts with starter ideas in physical and/or visual form. Make a practice of prototyping and critique in workteams.	Grow playful and trusting environment within broader team	Include influential groups within organization in decisions and experiences to grow support	Grow team of practitioners and organizational partnerships	Suport colleagues passions and display keen interest in potential future work partners and advocates	Develop appitude for various design methods and approaches in broader diversity of situations	Self: Increase complexity of project challenges to grow personal capabilities Others: Use low-risk confidence-building challenges, positive support and team infrastructure to develop others.
Empower and maximize	Share all signature stories broadly internally and externally to help develop new microclimates	Develop approaches and mindsets to broaden prototyping ability more broadly	Serve as model and mentor for other teams	Become vocal advocate for design community inside/outside of organization	Seek partnerships from external experts to energize and grow self	Identify and connect members of personal network together based on their needs and passions	Mash up design approaches with other methods such as lean and six sigma	Create infrastructure within organization to enable spread of additional microclimates (training, incentives, mentors, etc)

First, the **basic components** of the microclimate model were captured and put into three phases of development based on the research findings.



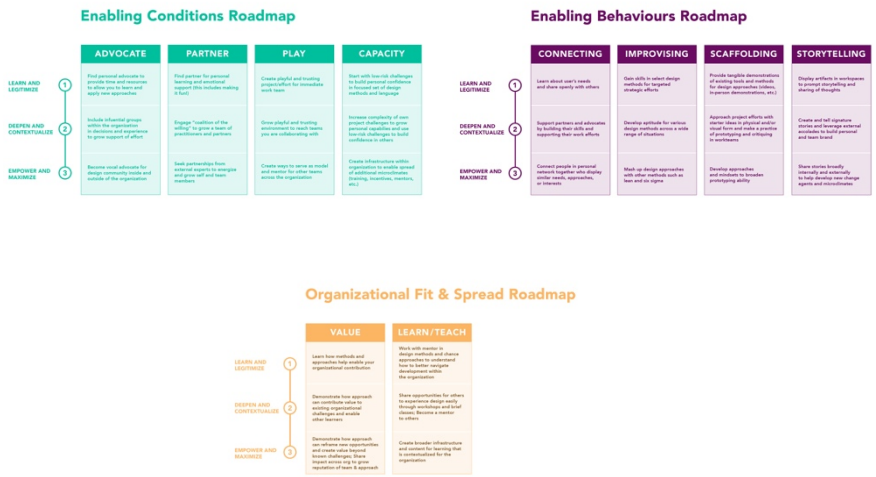
Participants were provided with the above grid shown in this table and asked to **mark each cell** containing a description as seen here. Green was used for “This resonates with my experience and knowledge”, yellow for “This resonates but needs some changes”, and red for “This does not resonate with my experience or knowledge”. The tally of each opinion was labelled beside each cell.



Active enablers to champion innovation and change through design

	Enabling Conditions				Enabling Behaviors				Organisational Fit and Spread	
	Playful and trusting environment	Advocate	Partner(s)	Behavior change /Capabilities	Interest in others	Storytelling	Scaffolding	Improv of approaches	*Organizational and personal value	*Learning/Teaching
Stages of Microclimate development										
Learn and legitimize	Create playful and trusting project/effort for immediate work team	Find personal advocate to provide time and resources to allow you to learn and apply new approaches	Find partner for personal learning and emotional support (includes making it fun!)	Start with low risk challenges to build personal confidence in focused set of design methods and language	Learn about user's needs and share openly with others	Display artifacts in workspaces to prompt storytelling and sharing of thoughts	Provide tangible demonstrations of exising tools and methods for design approaches (videos, in-person demonstrations, etc)	Gain skills in select design methods for targeted strategic efforts	Learn how methods and approaches help enable your organizational contribution	Work with mentor in design methods and change approaches to understand how to better navigate development within the organization
Deepen and contextualize	Grow playful and trusting environment to reach teams you are collaborating with	Include influential groups within organization in decisions and experiences to grow support of effort	Engage "coalition of the willing" to grow team of practioners and partners	Increase complexity of own project challenges to grow personal capabilities Use low-risk challenges to build confidence in others.	Suport partners and advocates by supporting their work efforts and building their skills	Create and tell signature stories and leverage external accolades whenever available to build personal and team brand	Approach project efforts with starter ideas in physical and/or visual form. Make a practice of prototyping and critique in workteams.	Develop appitude for various design methods across a wide range of situations	Demonstrate how approach can contribute value to existing organizational challenges and enable other learners	Share opportunities for others to experience design easily through workshops and brief classes, Become a mentor to others
Empower and maximize	Create ways to serve as model and mentor for other teams across the organization	Become vocal advocate for design community inside/outside of organization	Seek partnerships from external experts to energize and grow self and team members	Create infrastructure within organization to enable spread of additional microclimates (training, incentives, mentors, etc)	Connect people in personal network together who display similar interests, approaches or needs.	Share stories broadly internally and externally to help develop new change agents and microclimates	Develop approaches and mindsets to broaden perspective ability more broadly	Mash up design approaches with other methods such as lean and six sigma	Demonstrate how approach can reframe new opportunities and create value beyond known challenges. Share impact of value creation across organization(s) and grow brand reputation of team and approach	Create broader infrastructure and content for learning that is contextualized for the organization broadly

Categories were edited to better align with user input and **colour coded** as a visual cross-reference to the microclimate categories. Additional descriptions were added to clarify **broader organisational needs** outside the microclimate.



Final version of the design competency model with the same content as above in this table. This version is more fully designed visually for ease of use and clarity.

Figure 7.5: Evolution of the microclimate implementation roadmap

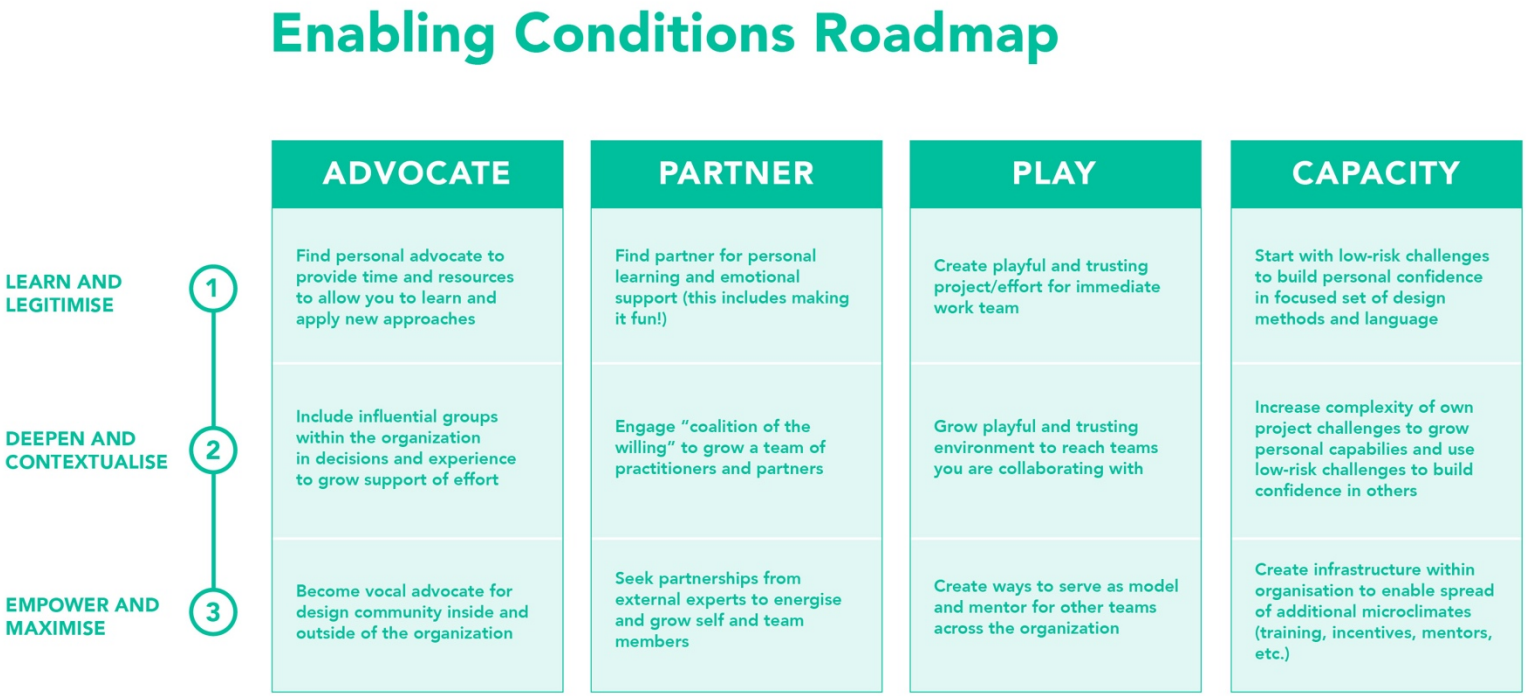


Figure 7.6: Microclimate implementation roadmap-enabling conditions

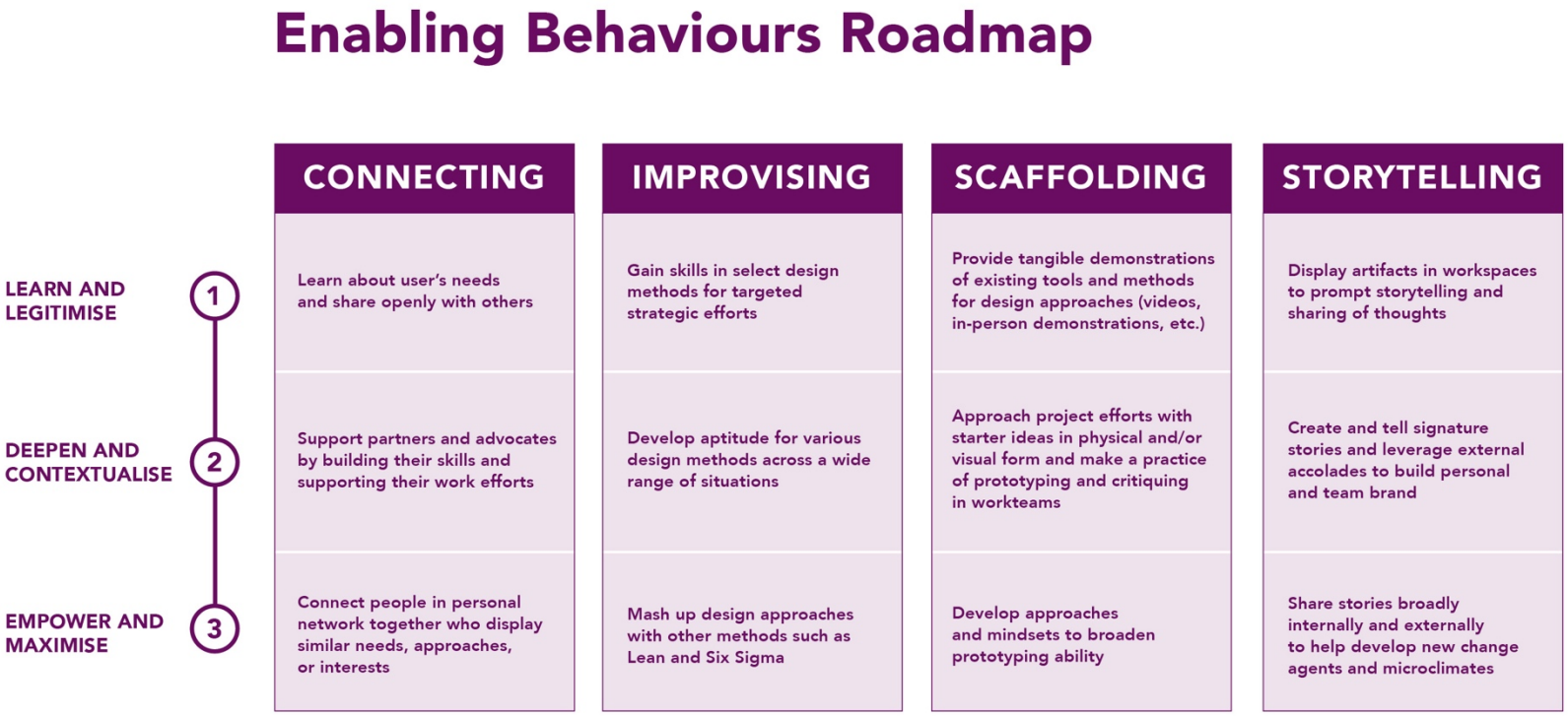


Figure 7.7: Microclimate implementation roadmap-enabling behaviour

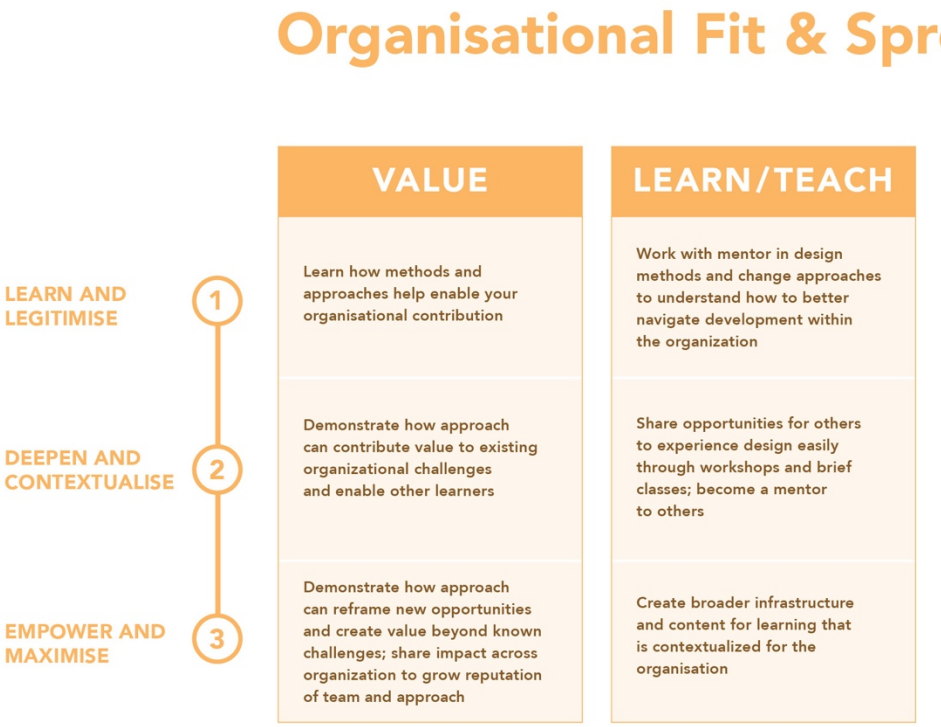


Figure 7.8: Microclimate implementation roadmap organisational fit and spread

The users discussed that the elements contained in the behaviours and conditions could each be addressed and adjusted separately as a diagnostic for their change agents and the teams more broadly. If each component is understood and mapped on the roadmap, then an individual or a team can see who is stronger or more progressed in certain areas, allowing others to leverage their strengths for their organisational work and potentially learn to develop in that area as well. This will also allow the advocates who support them to have a better sense of what people may need, both as individuals and as a team.

When used together, the outputs described demonstrate how HCD for innovation can be approached within an organisation even before it is pervasive in the organisational culture, as was the case for most of the research participants. In Section 7.7, the two models and roadmap are discussed as a complete system approach.

7.7 Final models as a system

After many iterations through co-design sessions, the final models resonated with the participants and were deemed both reflective of their experiences and valuable for growing the ability to learn and apply HCD for innovation within an organisation. Their perspectives represented a range of organizational contexts both from within and outside of healthcare. The output demonstrates the ability and need to contextualise learning and implementation approaches into real organisational environments. Each of the following figures provides an example of how the models and framework could be used across a range of industries. Three examples are provided: Figure 7.9 demonstrates the need to support HCD competency development within an organisation, Figure 7.10 shows how leaders can support the enabling conditions of HCD for innovation, and finally, Figure 7.11 provides an approach for how the research output can be used to help individuals/teams activate enablers for learning and applying HCD for innovation.

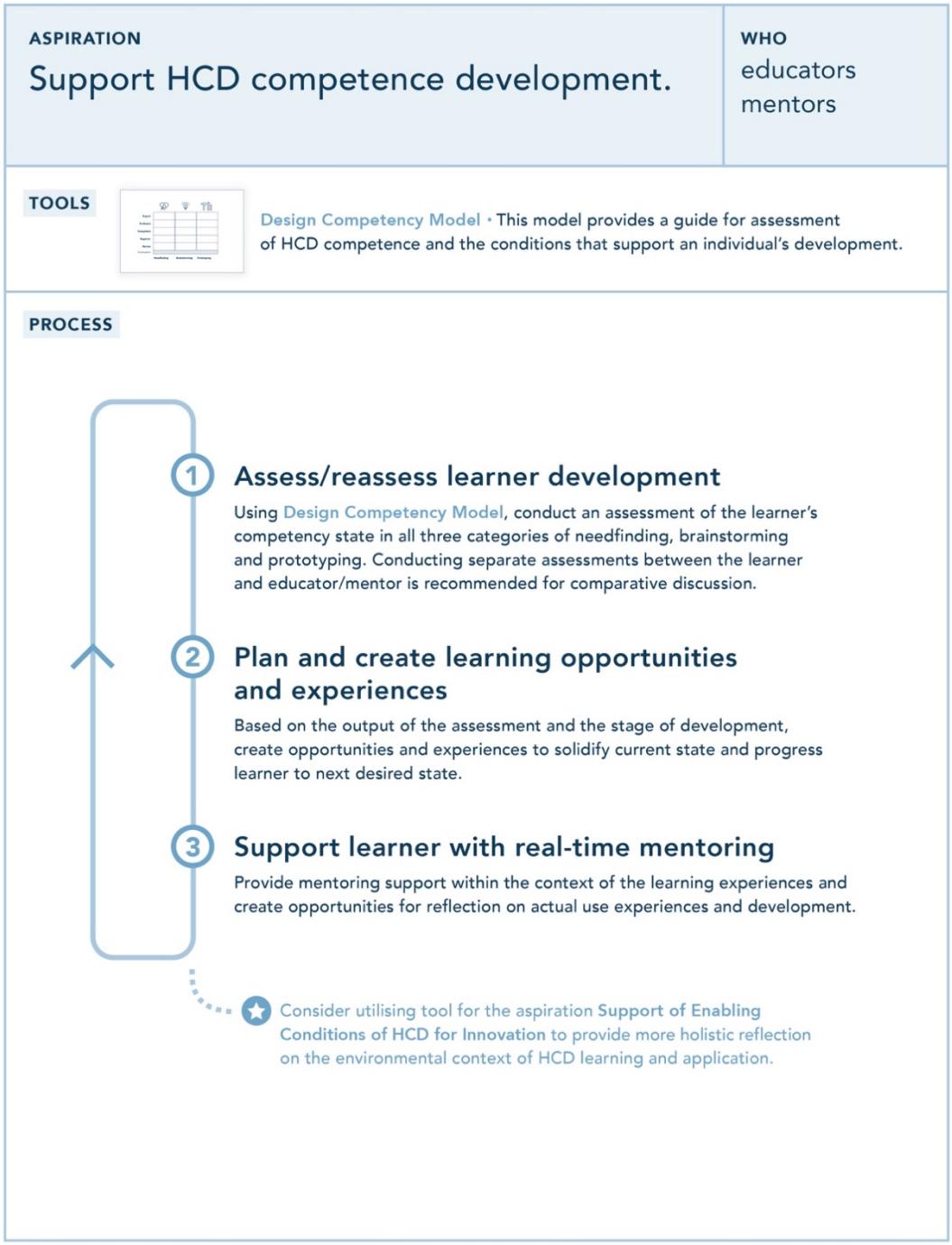


Figure 7.9: Support HCD competency development

Academic professionals who participated in this research voiced their support and interest in the design competency model as a tool to plan HCD curricula for their classes and as a performance assessment tool. (Note: two university professors began using the model to develop educational curriculum during the writing of this thesis.) By clarifying stages of development for HCD learners, an educator in a classroom could be clearer about why certain tools and methods were being taught and what a reasonable expectation may be for a learner at various stages. The educators also believed it would be useful when working with organisations for placement of students, as it could allow them to set proper expectations about the skill level and abilities of the students.

Educators and mentors within organisations could benefit, too, as the learning and development of those within the workforce can be assessed, discussed, and more thoughtfully planned. Learners, on the other hand, can create a personal roadmap for their own development and for that of their teammates. This would allow for a clearer understanding of developmental opportunities and potentially of expectations from both the learners and the organisational educators/mentors.

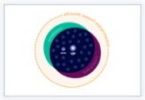
ASPIRATION

Assess enabling conditions of HCD for innovation.

WHO

leaders
change agents
advocates

TOOLS



Microclimate Model · This model provides an approach to reflect on and discuss key enablers for leading innovation and change within a counter-cultural setting by highlighting enabling conditions and behaviours.

Microclimate Implementation Roadmap · This roadmap provides a guide to assess the current context in which HCD for Innovation is being learned and applied. It describes how to further develop each enabler and behaviour.

PROCESS

1. **Review the microclimate model and its components**

   Review the Microclimate Model and its purpose. Reflect/discuss each of the eight components for clear understanding as it relates to own organisational context.

2. **Prototype a shared vision and approach**

   Based on the reflection/discussion output, develop an early stage shared vision of how these components compare to the current state and an ideal future state.

3. **Assess/reassess microclimate enablers**

   Using the Microclimate Implementation Roadmap, conduct an assessment of the immediate environment in which the individual leading the change resides. Conducting separate assessments between the change agent, advocate and partner(s) for comparative discussion is ideal.

4. **Plan and activate approach to maximise components of enablers**

   Based on the output of the microclimate roadmap assessment and the shared vision created, create opportunities to solidify current state and to progress microclimate to next desired state.

Figure 7.10: Assess enabling conditions of HCD for innovation

The use of the identified enablers from the exemplars studied in Chapter 5 and echoed by the novice learners in Chapters 4 and 6 create an approach for how to lead with more clarity than existed before this empirical research. The example provided in Figure 7.9 demonstrates how the microclimate model and implementation roadmap can be used to assess enabling conditions for HCD and innovation within the organisational context. Organisational leaders, whether change agents or those advocating for their support and protection, can reflect and act on what is needed to do to create the environmental context. With this knowledge, leaders can better enact their leadership influence to enable innovation from the workforce around them.

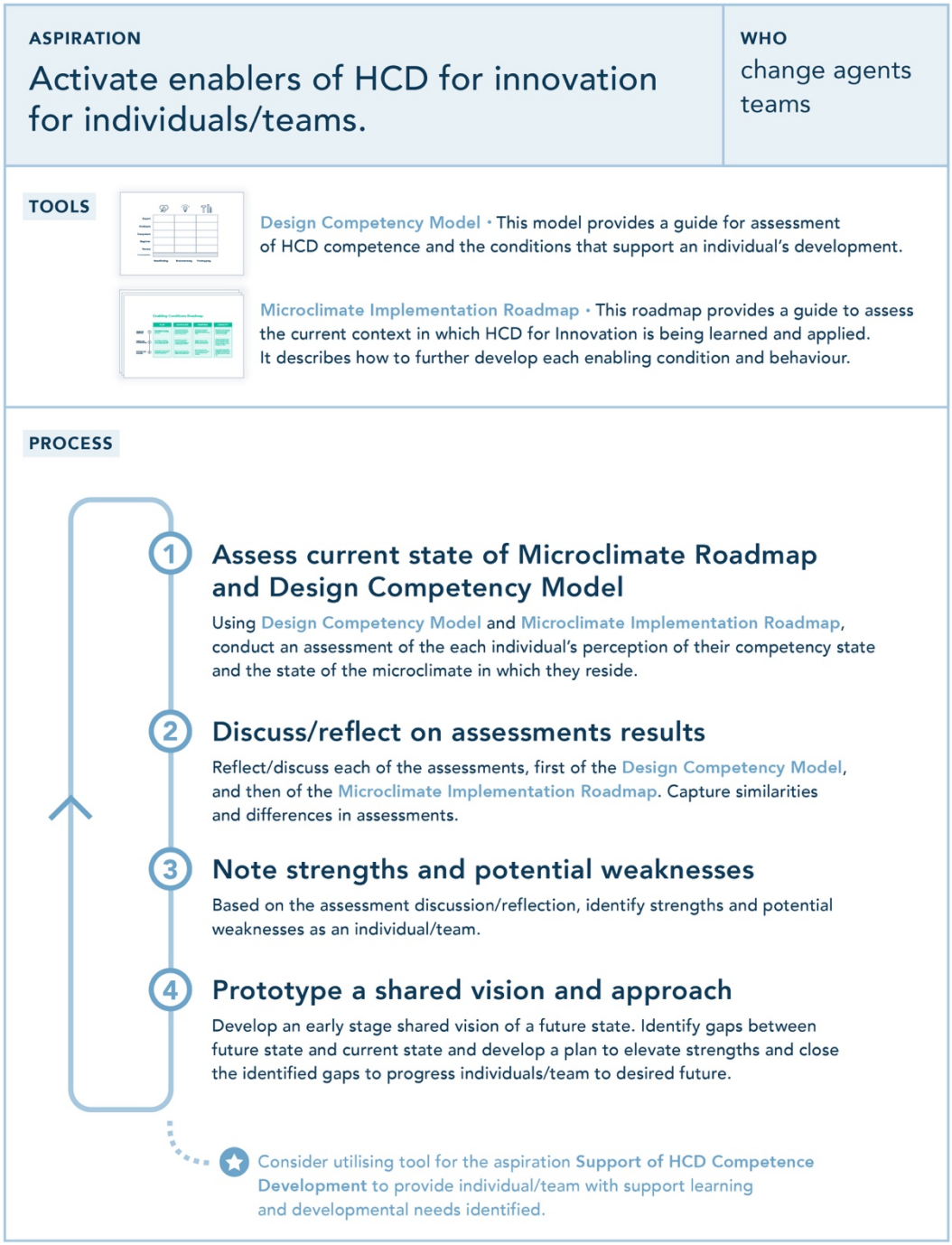


Figure 7.11: Activate enablers of HCD for innovation for individuals/teams

The longitudinal study of learners in the Catalyst programme in Chapter 6 demonstrated a rarely seen view of how learning HCD in the context of an organisation occurs over time. Based on these observations and user feedback, the design competency model was created, offering a set of learning stages for HCD within an organisation for the first time in academic literature. The example in Figure 7.9 demonstrates how the use of a common tool can enable change agents, and others who are a part of learning and applying HCD for innovation, to create individual and shared approaches to further HCD's application.

It was also found that learning and applying HCD for innovation within an organisation is most beneficial when it is viewed in that same context. This is because most often, the organisational culture is not considered pervasively supportive or at least aware of how to create infrastructures to support innovation or knowledge of how to develop the workforce capacity. This led the exemplars in Chapter 5 to create a set of enabling conditions and behaviours, deemed the microclimate model in this research, and those insights created a vision of success for the other studies. Figure 7.10 demonstrates how leaders can utilise the microclimate model and implementation roadmap to create a shared vision and an approach to help them reach it.

Figure 7.11 provides an example of the use of the microclimate implementation roadmap and the design competency model together. When individual assessments are made and viewed holistically as a team, potential skill and environmental support gaps may be apparent. Additionally, going from individual assessments to group assessments allows teams to call out their differing skillsets and discuss how they may want to leverage their strengths to create change within the organisation. The utilisation of both the microclimate implementation roadmap and the design competency model can provide clarity as to the current state of both the design competencies and the context in which they are being implemented and potentially provide a path to narrow the gap between the identified current state and the desired future state.

These scenarios, shown in Figures 7.9 to 7.11, demonstrate three examples of how the research contributions could be used by leaders to build a workforce capacity to learn and apply HCD approaches to innovation and transform healthcare. This is not an exhaustive set of how the models could be applied, but the examples offer tangible

cases that can be enhanced and built upon by others within healthcare and more broadly.

7.8 Chapter conclusion

This research identified specific enablers for those seeking to champion innovation and change in large organisations. Building further upon these enablers, leadership actions and areas of focus were suggested. These were mapped to literature that suggests support for these actions, which until now have not been mapped directly to this context. Overall, the actions emphasise approaches to enhance workplace culture and leadership engagement to encourage innovation in a manner that directly addresses the needs of the organisational workforce.

Also described in this chapter are the two theoretical models developed and an implementation roadmap, together with a few sample cases demonstrating how the output of this research could be utilised by mentors and educators who may be seeking to develop learners, leaders who are seeking to create an organisational culture to support HCD for innovation, and individuals or teams who are empowered to develop their own practice within an organisation.

These models and roadmap represent a significant contribution to knowledge. The design competency model enables an approach to both track individual development and anticipate the conditions needed to develop expertise in HCD (Figure 7.2). The microclimate model (Figure 7.4) was developed based on the successful practices of 15 exemplars in HCD and provides a new-to-the-world set of heuristics, allowing others the ability to replicate the practices of exemplars. Finally, the microclimate implementation roadmap (Figures 7.6 to 7.8) is a supporting tool to aid in an assessment of one's current microclimate. It provides next steps to guide the implementation and further development of HCD for innovation within an organisational setting. Each offer actionable approaches for leaders to build a workforce capacity to learn and apply HCD to innovate and transform healthcare and achieve the aim of this empirical research.

In the final chapter, a discussion and conclusion summarises this work further and addresses its implications, contributions, conclusions, and future work.

Chapter 8: Discussion and conclusions

The rising cost of healthcare and the inability to provide adequate care for an ageing and more complex patient population is putting systems around the world under pressure to change (Berwick 2003; Berwick, Nolan, and Whittington 2008; Bessant and Maher 2009; Bevan et al. 2007; Groves et al. 2013; Länsisalmi et al. 2006; Roberts et al. 2016). Innovation is being demanded both in the way products and services are provided, as well as in the way healthcare systems are structured to support radical changes (Christensen, Grossman, and Hwang 2009; Roberts et al. 2016). Healthcare is in need of a workforce with the capacity for innovation to aid in these changes, but the approach of how to do this remains unclear and understudied (Bohmer 2010; Cresswell, Cunningham-Burley, and Sheikh 2017; Duncan and Breslin 2009). This research aimed to provide insights into the enablers to innovation and use of HCD in healthcare, and how to best approach this given the lack of a supportive infrastructure for workforce innovation and a risk-averse culture.

Prior research has focused on how HCD can be used as an approach to build innovation capability within an organisation (Carlgren, Elmquist, and Rauth 2014, 2016a), but as shown in Chapter 2, there is a lack of research exploring how individuals implement and leverage HCD in the context of their work environment (Carlgren, Elmquist, and Rauth 2014, 2016a; Chang and Rieple 2013; Liedtka and Ogilvie 2011; Seidel and Fixson 2013) and particularly in healthcare (Berwick 2003; Bohmer 2010; Coughlan, Suri, and Canales 2007; Roberts et al. 2016). If healthcare is to address the complex challenges that are pervasive across the industry, there is a need to develop the workforce capacity to innovate.

To aid healthcare in this challenge, the aim of this research was to explore and create actionable approaches for leaders to build a workforce capacity to learn and apply HCD to innovate and transform healthcare. The specific objectives were to

1. explore and review cross-disciplinary literature related to the application of HCD to support innovation in healthcare;

2. understand an untrained individual-level view of experiences leading innovation and change and identify common enablers;

3. study cross-industry HCD exemplars to gain their perspectives on the use of HCD to develop innovation capabilities within a workforce and identify common enablers;

4. explore the learner's experiences over time and map the HCD learning journey;

5. propose models and a practice-based framework to empower organisational leaders to aid in the development of HCD capabilities for innovation within the workforce.

8.1 Summary of outcomes

The findings were brought together from three studies to address the stated objectives.

Each objective and the resulting findings are summarised in Table 8.1. This highlights the research approach, the findings, and the resulting output or contribution to knowledge.

Table 8.1: Summary of research objectives and findings

Thesis objective	Chapter	Findings
Explore and review cross-disciplinary literature related to the application of HCD to support innovation in healthcare	2	• Innovation in healthcare is seen as worthwhile (Bessant and Maher 2009; Christensen, Grossman, and Hwang 2009; Länsisalmi 2006), yet conducting innovation in healthcare is complex (Bohmer 2010; Cresswell, Cunningham-Burley, and Sheikh 2017; Duncan and Breslin 2009) and the workforce is not naturally empowered to create changes (Berwick, Nolan, and Whittington 2008). • Healthcare thought leaders have touted that one of the best ways to address the need for innovation in healthcare is for its workers to develop a competency for innovation (Bessant and Maher 2009; Berwick 2003; Berwick, Nolan, and Whittington 2008); however, there is little written about how innovation capabilities can actually be built and developed in practice (Carlgren, Elmquist, and Rauth 2014; Schreyögg and Kliesch-Eberl 2007). • The use of design methods for innovation challenges has been studied and found to be a successful way to approach innovation (Beckman and Barry 2007; Seidel and Fixson 2013), but there is a lack of empirical research on how to actually build these capabilities within individuals or the wider organisation (Börjesson, Elmquist, and Hooge 2014; Carlgren, Elmquist, and Rauth 2014). • Having determined that design methods, or HCD, is likely to be of value for driving innovation in healthcare (Bevan et al. 2007; Coughlan, Suri, and Canales 2007; Hillgren, Seravalli, and Emilson 2011; Lin et al. 2011), it is important to explore how these approaches are learned and applied in multidisciplinary teams to build innovation capabilities within the healthcare workforce.
Non-designers' experience of leading innovation and change	4	• To begin to understand the person-level innovation experiences by those who have never received any training in innovation or HCD but are seeking a better way to lead innovation, 125 nurses were studied.

		• It was found that those new to innovation within the work context have often had empowering experiences of being a champion of innovation and change outside their work environment, but may lack confidence and perceived support to champion innovation inside their work environment. • This confirmed a gap between the need to innovate within the healthcare workforce and the lack of confidence and ability to innovate, thus providing a worthwhile space to explore. • Additional needs were also uncovered that aid in championing innovation for those in the nursing profession, such as a personal need for the solution, challenges with a meaningful purpose, clarity of goals and resources, ability to experiment, experiencing progress quickly, positive encouragement and personal confidence, and psychological safety. • Given the small number of exemplars in healthcare for using HCD for innovation, it was determined to broaden the study of exemplars to also include non-healthcare industries to gain cross-industry insights of enablers for innovation in an organisational setting. This occurred in the change agent study.
Study cross-industry HCD exemplars to gain their perspectives on the use of HCD to develop innovation capabilities within a workforce	5	• Cross-industry exemplars, called change agents, were identified through a rigorous process resulting in in-depth interviews and journey map exercises with 15 different individuals. • The results of the change agent study identified a set of approaches that a broad range of leaders actively put into place to support innovation through HCD, despite the organisational processes or cultural support to innovate. • The change agents described how they created smaller pockets of innovation practitioners and learners within the areas of the organisation where they had more direct control or authority, and the literature was again reviewed to find research that may help to explain this phenomenon. • It was found in the literature that the main barriers to the development of innovation capabilities, or the so-called “muscles for innovation”, seem to come from the lack of organisational norms and values that support building innovation capabilities (Börjesson, Elmquist, and Hooge 2014) as well as the lack of organisational processes for innovation (Christensen, Bohmer, and Kenagy 2000). It

		was hypothesised that the change agents approach organisational innovation in this way to counter the lack of broader organisational norms and processes (Ulrich and Smallwood 2004). • A descriptive model of the change agent enablers and the description was shared with and iterated with the change agents until it was confirmed as representative of their experiences and found to be useful.
Explore the learner's experiences over time and map the HCD learning journey	6	• As noted in the literature, the creation of innovations should be supported by processes that can be understood and practised by individuals within the organisational workforce (Berwick 2003; Carlgren, Elmquist, and Rauth 2014). • To provide a real-time "in-the-wild" view into a learner's development and the impact of organisational context, 56 new learners were observed longitudinally over a year of their learning and application journey (Innovation Catalyst study) along with the coaches who helped to teach and mentor them. • Key insights were that the development of the learner only occurred with application of the new skills, not solely by formal teaching, and that the learning seemed to occur in stages that showed a change in the practice and application ability of the learner. • After an additional literature review to try to better understand and describe the phenomena, the Dreyfus skill development model (Dreyfus and Dreyfus 1980; Dreyfus 2004) and the subsequent Benner nursing competence model (Benner 1982, 2004) were found to be the best representations for what was being observed, and for the first time in literature it provided a pathway for learning and development of HCD through formal instruction and practice. • The descriptive model was developed and was shared and iterated with the innovation catalysts, coaches, and change agents until it was confirmed that it was descriptive of their experiences and found to be useful.

Propose practice-based frameworks to empower organisational leaders to aid in the development of HCD capabilities for innovation within the workforce	7	• Two models and an implementation framework were created through iterative feedback gathering during user co-design sessions. • Model 1 – Microclimate model: a model created from insights with exemplars in HCD for innovation and co-created with these users. It was created based on the exemplars' learnings to empower leaders at different levels within an organisation who want to lead change and innovation across healthcare using HCD. • Framework – Microclimate implementation roadmap: a framework to actualise the microclimate model by providing a three-level roadmap to guide the development of each condition and behaviour contained in the model. • Model 2 – Design competency model: an innovative model to codify and track the developmental journey of new HCD learners based on the Dreyfus skill-building model and the Benner nursing competence model. It is argued that this model creates a new-to-the-world approach to explicitly map the experiences of HCD learners and their learning and development pathway and, more broadly, guides competency of HCD to apply towards innovation within organisations.

Pulling these studies and findings together leads to an argument that innovation can be created in healthcare when there is a workforce that has a capacity for creativity and innovation and an environment that is viewed as psychologically safe, with the needed resources, infrastructure, and support to conduct the innovation activities (Chin et al. 2012). The extensive study resulted in a range of conclusions as well as emerging theoretical models: a design competency model (Figure 7.2) to build the capacity for HCD skills, a microclimate model (Figure 7.4), and a microclimate implementation roadmap (Figures 7.6 to 7.8) to create the needed resources, infrastructure, and psychologically safe environment for their application. As such, this thesis has achieved its aim of aiding others in learning and applying HCD in large organisations within healthcare and likely more broadly, rather than them waiting for organisation-wide changes. This creates a novel starting point that can be enacted upon more quickly than an entire organisational culture change by a diverse group of leaders and their teams.

8.2 Overall conclusions and original contributions

The literature indicated that healthcare is in need of innovation but is challenged to innovate. Three areas were called out that contribute to this: the culture of risk adversity within healthcare, the lack of infrastructure capabilities to support innovative work, and a workforce that has not developed innovation competencies. This research has identified a set of common enablers to champion innovation and has deepened those findings into the use of HCD for innovation within large organisations. Unique viewpoints were captured from exemplars/experts who successfully created a strategy to address the risk-averse culture and lack of innovation infrastructure through a novel approach (Chapter 5). Their strategy avoided the daunting efforts of changing the entire organisation and instead created microclimates for HCD that functioned differently than the predominant culture of the organisations through the creation of enabling behaviours and conditions. To push the knowledge on workforce competencies as well, these insights were refined through a longitudinal study of learners within a range of healthcare organisations to create a novel approach to learning (Chapter 6).

Design methods were employed to develop both theoretical and practical outputs (Chapter 7). Building on the existing research that demonstrates the value and impact that HCD can have on innovation, this work takes a step further by observing and co-

creating with users to reveal approaches for HCD to be put to use within organisations. A design competency model was developed to codify and track the developmental journey as new HCD learners build their abilities over time. Without an understanding of how and what skills develop, expertise is more or less left up to chance. By creating a model for its development, both the learners and those supporting or teaching HCD have a higher likelihood of developing skills and abilities that are so desperately needed in the workplace.

And as was evident throughout this research, context cannot be separated from the acts of either learning or applying new methods and skills. The aforementioned microclimate model was created from direct insights and experiences from exemplars in HCD and innovation. It shifts the focus from the need for overall cultural change within a healthcare system or other entity to the mindset of what a leader or change agent can influence and control from their role within an organisation. To date, studies have focused on how organisations overall can create structures to support innovation and design. These results shift the focus to that of the individual and their ability to create a smaller culture, or microclimate, within the larger organisational entity in which they reside. It provides an actionable approach to empower healthcare change agents to lead innovation from their place of influence regardless of their background or organisational role.

This research offers further clarity about the working conditions and behaviours that facilitate the implementation of HCD methods in healthcare by both leaders and a workforce. It also creates a path for capability development that is tangible and takes active contextual learning into account in developmental stages. Together, this research provides a practice-based approach to empower leaders to lead innovation through its workforce in a way that is counter to their organisational culture, yet potentially transformational.

In summary, the research has resulted in the following original contributions:

1. Mapping of key supportive conditions and behaviours for individuals to successfully apply HCD for innovation;

2. Development of a microclimate model, which includes necessary components for successful application of HCD methods in large organisations;

3. Development of an implementation roadmap for the microclimate model to provide a path for leaders of change to develop their own microclimate for innovation within the workforce;

4. A new design competency model that proposes stages of learning HCD methods for innovation by multidisciplinary teams, which was achieved through a novel application and enhancement of the Dreyfus skill-building model and the Benner nursing competence model.

When viewed together, the models and the framework provide a suite of tools to enable HCD development and application within the workforce. They should help to empower leaders with a stronger ability to guide HCD development. The evidence-based approach to development suggests they will enable better approaches and structures to support further skill building and evaluation of progress as individuals grow from novices into expert practitioners. Ultimately, when these potential outcomes are viewed together, it supports the innovation needed in the healthcare industry through the use of HCD in its multidisciplinary workforce.

8.3 Shaping the research approach

The research field of studying HCD learning and application within an organisational context is still considered nascent, as it lacks theories and models and is viewed as an area for exploration of new constructs. This type of research calls for qualitative approaches, and thus, semi-structured interviews, observations, artefact analysis, and co-design approaches were used throughout the process of this research. The rigour of the findings was enhanced through the inclusion of users who reside both inside and outside organisations and at various levels of expertise across three separate but complementary studies.

Research within an organisational context was identified as a gap in the literature, and therefore, active efforts were made to study this phenomenon in this light. The effort and coordination needed to reach and involve people working across many organisations, all

with differing and shifting schedules, was complex, even more so than originally anticipated. However, learning from and experimenting with users helped to ensure that their needs were actively kept at the forefront of the research development and addressed the need for organisational context. With a desired end goal of creating something that is useful and practice based, the effort required in grounding the research in this way was important. Experimenting with different types of thought leaders, new learners and expert practitioners enhanced the trustworthiness of the data and ultimately influenced the creation of a set of guidelines that will make the work more actionable overall.

The literature and field of knowledge that serves as the base of this research is quite wide, encompassing HCD, user experience, change management, OD, leadership, healthcare, creativity, and individual and organisational innovation, as a start. It is believed that this diverse body of literature makes the work more reflective of the complex dynamics of real organisational settings and realities. However, also because of this diversity, it is possible, if not likely, that some literature useful for this research may have been missed. Ideally, all known knowledge would have been taken into account. While great efforts were made to find the most relevant and useful knowledge for this research through searches and expert suggestions, a narrower and less cross-functional research study may have been an alternative approach to build a literature review that yields more depth and confidence that the topic was covered comprehensively.

Following the desire to have a broad knowledge base, active participation from a cross-section of users of the research through co-design sessions, presentations, and publications was also adopted to explore their views and feedback of the models and the roadmap during the course of the research. This informed the final development of the theoretical models and ensured the end user remained central to the design. It is believed that this user input will help to further the implementation of the new theoretical models in the future.

8.3.1 What this thesis did/did not cover

This thesis did not evaluate the level of innovativeness the HCD efforts led to within the organisation, nor did it evaluate the impact the change agents or the others included in this study had on organisational change. It also did not evaluate the impact that HCD

had as a methodology of the organisation, on teams or on individuals, as the impact of HCD can be found in other research as stated in the literature review. Instead, it focused on how the phenomena of learning and applying HCD for innovation and change occurred within the context of an organisation.

This body of work provides models and frameworks developed through qualitative ethnography. It offers approaches that have been reviewed and supported by users as plausible and reflective of their personal experiences. The resulting frameworks and models capture a set of new-to-the-world heuristics for other existing or hopeful leaders of change for practitioners of HCD within large healthcare organisations and potentially more broadly.

8.4 Further research

It remains to be seen through future research what the broader impact of HCD learning and application approaches will be on the organisations represented in this study. A natural next step of the work would be for an individual or team of hopeful change agents to take the models and framework and apply it within their organisation. To continue the research, the experiences could be observed over time, in a similar approach to that conducted within the Catalyst programme. While the potential users provided feedback and shaped the output, the timing and scope of the work did not allow a study to test the resulting models and framework in a work environment. To this end, the development of supporting curriculum to explain and apply the microclimate model would also be a useful development. It would be worthwhile to study the implementation of this model with various curricula approaches to determine how to best support its activation.

Understanding an approach to growth through the development of additional HCD microclimates, or through the expansion of existing ones, would further the impact of the research for large organisations who are looking to spread HCD more broadly. This would entail following development over time, perhaps in another longitudinal study. The development and spread of microclimates was raised as a question in numerous user feedback sessions, suggesting it as a valuable area of knowledge development for practitioners within organisations. A benefit of approaching the learning and application

of HCD through the microclimate model approach versus a more traditional top-down initiation is that the microclimate approach is more democratic in nature. It provides the opportunity for a broader audience of organisational employees the chance to be empowered to create and lead the change. If these organisational employees, or change agents, follow the lessons and practices learned from the exemplars who participated in this research, the intent is that they, too, can begin to create their own microclimate to learn and apply HCD for innovation.

To begin to trial this approach, two individual leaders from Lurie Children's Hospital in Chicago, Illinois, and KP in Sacramento, California, will attempt to utilise the microclimate model and roadmap for a project requirement they have to undertake within the healthcare fellowship program. Neither individual is on the executive team of the organisation, but they are leveraging their leadership positions to execute on the models. Their experiences will be captured and documented to help refine and evolve the approach to embedding the work within organisations. The goal of these two leaders is to grow their ability to lead and foster innovation within their organisations, and they have chosen the outcomes of this research to help them in that endeavour.

The researcher, serving as a mentor and consultant to the leaders, will hold a series of one-on-one meetings with each individual leader over the course of six months. The two leaders will additionally provide support and advice to each other based on what they are learning, and they plan to meet one to three times each month. A goal of the approach is to aid the leaders in developing an organisational microclimate that could serve as a concrete example of how innovation and design could be utilised in context of each organisation. This modelling approach would then allow others to begin to replicate their approach to form microclimates of their own, which will begin to grow and spread the approach throughout the organisation. The initial pilot implementation will proceed in the following way for both leaders:

- Capture questions and areas of interest within the microclimate model.
- Select where they believe they are currently best represented on the microclimate roadmap.

- Verbally articulate their thought process to the researcher.
- Discuss their status on the roadmap and where they would ideally be in six months.
- Based on the assessment and on the interest of the leaders, create and utilise a learning plan.
- During each one-on-one meeting, capture experiences and reflections of the leaders.
- Capture and share the pilot data collected over six months with a group of healthcare peers during the fellowship program.

At the end of the six months, the microclimate roadmap will be completed again, and the leaders will be asked to verbalise their thought process during the roadmap exercise a second time. Comparisons will be made between the two points in time to capture shifts and changes, along with the monthly one-on-one discussions and any potential shifts or changes over time to look for patterns in experiences and reflections from the two leaders' experiences that can enhance the model and its usability.

Hypothetically, this approach could provide some much-needed heuristics to follow while distributing the empowerment to change and innovate across a much wider organisational employee base beyond the top tier organisational executives. This wider employee base affords more touch points to enable replication and scale HCD within and across organisations, which the researcher posits will provide a higher likelihood that the approach will spread.

The use of the design competency model over time, as well, would be a rich field of study. Current practices in teaching HCD focus on the HCD methodology and mind-sets and skillsets, providing what is believed to be the important elements for a personal HCD toolkit. However, the learning journey itself is ignored. Educational programmes to date do not provide an approach or even a point of view on the sequencing or learning approach that may help to enable success for the new learner, such as the order of learning and the context and support that helps to enable it. User feedback stated that

the design competency model would also be useful when working with organisations for placement of students, as it would allow them to set proper expectations about the skill level and abilities of the students to find a better fit for both the student and the organisations. Studying whether this desired outcome was achieved would be valuable for future research.

This research also has potential implications beyond healthcare in other large organisations or complex environments that are struggling to develop HCD skills in the workforce for innovation. Approaches were provided that were also built on insights across a range of industries and reviewed through member and peer checking with individuals from a range of institutional backgrounds. Therefore, with some contextual modifications, the approaches to learn and apply HCD for innovation could also extend into non-healthcare organisations to empower their leadership and their workforce to lead change.

In summary, this thesis recommends future work in the testing of the implementation and acceptability of the design competency tools, both in organisational practice and in academic settings. Additionally, testing the nuances and sustainability of the microclimate approach to developing organisational capabilities in HCD is needed more broadly. There is a great deal of work that can still be done to move this young field of study going forward, but the knowledge presented here should provide a strong foundation for continued learning.

8.5 Concluding remarks

The aim of this research was to explore and create actionable approaches for how leaders can build the capacity to learn and apply HCD to champion innovation within the workforce to transform healthcare. A set of enablers and novel theoretical models were created through the application of design-driven methods and active user feedback. It was found in the literature review that healthcare faces many challenges when it comes to innovation, and three rose to the surface: a cultural aversion to risk, a workforce that has not been empowered with the capacity to innovate, and a lack of infrastructure to support and sustain innovation efforts. This research has shown how leaders and leading-edge change agents have overcome a risk-averse culture and poor

infrastructure to create microclimates for HCD that enable innovation. The microclimate model and the microclimate implementation roadmap provides others looking to create this change with an approach to begin. As for the workforce capacity to innovate, a design competency model was developed through field studies of learners at various stages of development. This design competency model provides a clearer understanding of the stages a learner of HCD goes through and the conditions needed to support their development.

Healthcare is ripe for a sea change in how it approaches the challenges that lie ahead, as are other industries facing complex challenges of their own. Incremental innovation is no longer enough. As with any large and complex social revolution, healthcare change requires a savvy workforce that is empowered to transform healthcare internally as well as through the creation of radical new partnerships across a wide array of industries and organisations. HCD as a common approach to innovate together is needed to bring healthcare and its workers into the 21st century.

As a clinician and healthcare leader, I know the frustrations that exist in being a part of the healthcare workforce that wants to create a significant and positive change but does not feed the confidence or abilities to make a real difference. The research presented in this thesis was created for others like me. It was not aimed at theoretical abstractions, but at exploring and creating useful approaches for individuals to build the capacity to both learn and apply HCD for real-world innovation, or in other words, to be empowered to innovate when perhaps the organisation you are a part of is not quite ready. While HCD is not the only way that change can be created, it is definitely a viable and teachable way that has proven to be valuable. This research points to a new path to begin to empower leaders to build the capacity for a multidisciplinary workforce to innovate thorough HCD and the supporting environments for its application. It provides an approach for individuals and team members who are looking to develop, for those looking to educate and mentor learners, and for those who want to empower themselves and their workforce to lead the way in the future.

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Zuber, C., and Moody, L. (2016) Learning from the Best: Unpacking the Journey of Organizational Design Thinking Leaders. *DMI Academic Conference* Paper, Boston, MA

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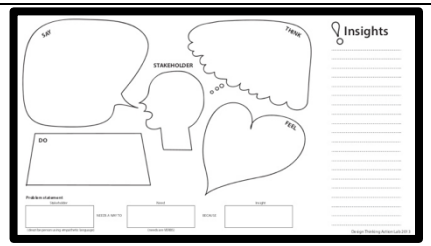
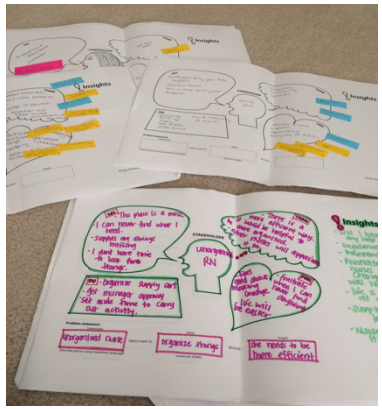
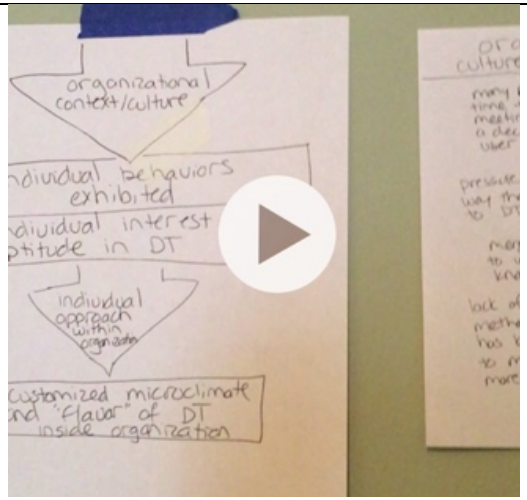
Appendices

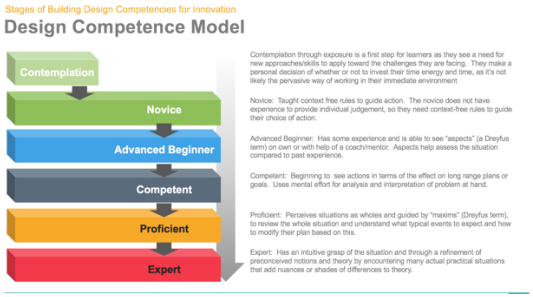
Appendix 1: Co-design approach across research

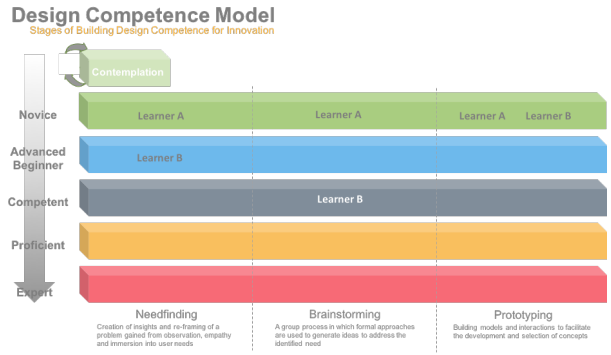
Research question	Desired outcome	Procedure and Participants	Artefacts and Images demonstrating Co-Design	Findings
What enables individuals who are striving to be champions of innovation and change?	An understanding of enablers specifically from the viewpoint of nurses who make up the largest workforce in healthcare	Pre-workshop: Identified Empathy Map as a design tool to provide needed insight within the given constraints of time and anonymity Workshop with staff nurses: Pair nurses together to interview each other and complete an Empathy Map describing their needs in the phenomena	 	Seven themes emerged and compared to Change Agents and Innovation Catalyst learners in following studies

Research question	Desired outcome	Procedure and Participants	Artefacts and Images demonstrating Co-Design	Findings
		Post-workshop: Identify themes and patterns in the responses Additional user feedback not allowed per ethics agreement of confidentiality. As a substitute the themes were	 THEORETICAL FRAMEWORKS / Innovation Leadership Characteristics (Weberg 2013) / Theoretical Dom (Michie et al., 2 count / Open code / boundary spaning, risk taking, visioning, leveaging opportunity, adaption, coordination of information flow, facilitation / knowledge, skills, pr beliefs about capabi about consequences goals, memory/atte environmental conte influences, emotion 3 Frustrated with process / facilitation / environmental conte 3 Clear target/aim to strive for / coordination of information flow / goals 5 Iterative testing and experimentation of ideas / adaption / memory, attentiona 2 Sticking to it, not giving up when it's hard / NO CATEGORY / behavioral regulatio 8 Ability to control resources/approach to test idea / facilitation / beliefs about capabil 8 Quick and cheap approach to finding new solutions / leveraging opportunity / reinforcement 7 Novel new ideas and making due with resources availat / adaption / knowledge, environ 9 Social time and collaboration with people I like / boundary spanning / social influences 5 Lack of manager support / boundary spanning / professional role an 18 Worry about others perceptions-psychological safety / risk taking / social influences 4 Positive encouragement from others / NO CATEGORY / social influences 3 Sense of completion, accomplishment / NO CATEGORY / emotions 15 Impact on self image "I did it" / NO CATEGORY / beliefs about capabil 8 Can see benefits of solutions "I see it" / visioning / beliefs about conseq 6 Can see benefits of solutions quickly / leveraging opportunity / beliefs about conseq 7 Quick positive feedback on ideas from others / boundary spanning / reinforcement, socia	

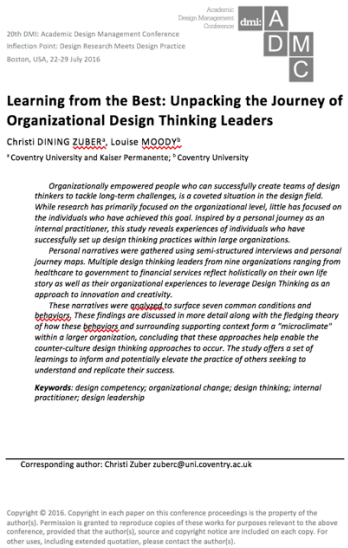
<table>
<tr><th>Research question</th><th>Desired outcome</th><th>Procedure and Participants</th><th>Artefacts and Images demonstrating Co-Design</th><th>Findings</th></tr>
<tr><td></td><td></td><td>compared to literature for deeper understanding, similarities and gaps</td><td><table>
<tr><th>Enablers for nurses</th><th>Rationale</th></tr>
<tr><td>Personal need for a solution</td><td>Curiosity and learning, social time with people they li
something that wasn't currently working in their persc</td></tr>
<tr><td>Challenges that have meaningful purpose</td><td>Participants looked for and recalled efforts they belie
to help others was a strong motivator for the participa
passion for the challenge at hand as a factor.</td></tr>
<tr><td>Clarity of goal and control of resources</td><td>The goal to be accomplished was clear and there was
including one of more of the following; money, peopl</td></tr>
<tr><td>Experiencing progress – quickly and visibly</td><td>Rapid and positive feedback was of importance to ide
influence others to participate in the change.</td></tr>
<tr><td>Active experimentation</td><td>Action-oriented approach helped to become a champi
Approach was active with repeated testing, and novel
resource scarcity or novel idea pairings.</td></tr>
<tr><td>Positive encouragement and confidence</td><td>Positive encouragement from others, resulted in a sen
do it!"</td></tr>
<tr><td>Detractor</td><td></td></tr>
<tr><td>Fear and Psychological safety</td><td>Fear of how colleagues and peers would react to their
Fear of being judged. Manager sees innovators as "tr</td></tr>
</table></td><td></td></tr>
<tr><td>What type of framework is useful to aid individuals attempting to learn and apply HCD for innovation?</td><td>Workshop 1: Develop refined set of potential models for further development</td><td>Pre-workshop: Provided images and descriptions of 8 different hand-sketched models 3 days to one week prior to in-person session to allow users time to review ideas and reflect on their reactions</td><td> 
</td><td>Stages of learning exist. Both learners and coaches/mentors would benefit from clarifying stages and how learning could/should progress.</td></tr>
</table>

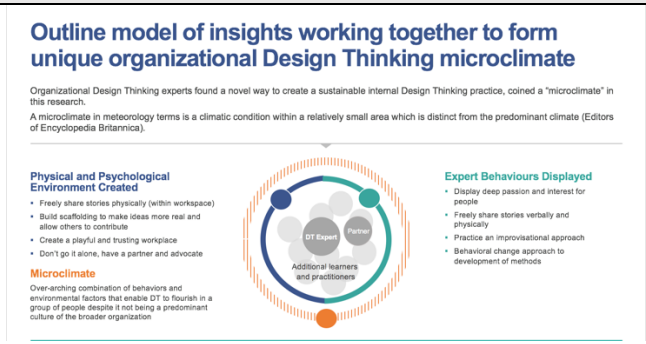
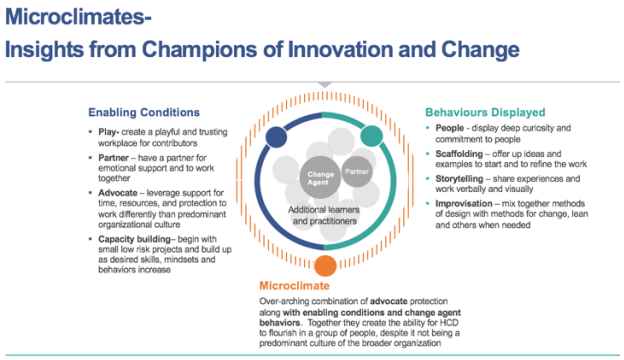
Research question	Desired outcome	Procedure and Participants	Artefacts and Images demonstrating Co-Design	Findings
	Workshop 2 and 3: Transferability and perceived value of applying Dreyfus & Dreyfus and Benner models to case study organizations	1st Workshop with Catalysts and Coaches: Each participant received paper copy of each draft model and asked to write feedback and edits for each Feedback shared by users in groups of 1-3 people and discussed with researcher	Some materials have been removed from this thesis due to Third Party Copyright. The unabridged version of the thesis can be viewed at the Lanchester Library, Coventry University. Some materials have been removed from this thesis due to Third Party Copyright. The unabridged version of the thesis can be viewed at the Lanchester Library, Coventry University.	There is an interplay between the individuals attempting to be change agents and the context of the environment around them. Showing what the change agents can actively do to grow their HCD practice within their environment is needed.

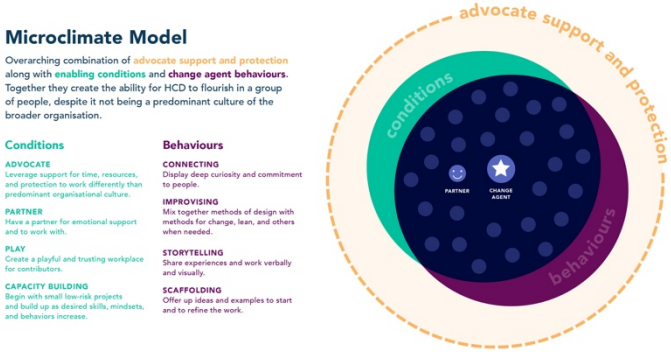
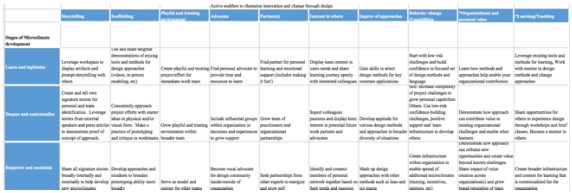
Research question	Desired outcome	Procedure and Participants	Artefacts and Images demonstrating Co-Design	Findings
		Post-workshop 1: Feedback compared for common themes and patterns		Categories overall resonated with participants. Minor changes needed for clarity.
		Workshop 2 with Catalysts and Coaches: Participants provided Design Capability Model to review and provide feedback.		Model stages and addition of "contemplation" stage resonated overall with participants, but it

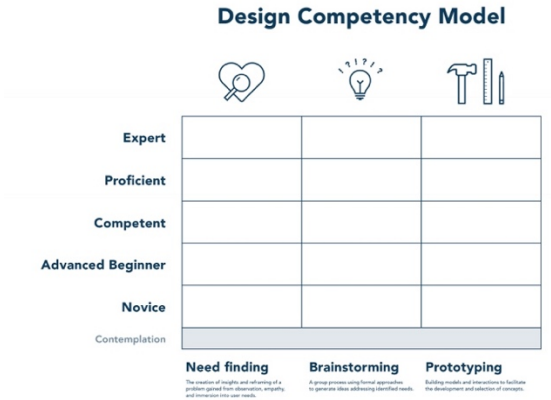
Research question	Desired outcome	Procedure and Participants	Artefacts and Images demonstrating Co-Design	Findings
		Feedback shared by users in groups of 1-3 people and discussed with researcher Post-workshop 2: Feedback compared for common themes and patterns	 	needed to account for different phases of design which were perceived to be learned with differing levels of ease and speed. There is a perceived value and application Design Competency Model for participants across industry

Research question	Desired outcome	Procedure and Participants	Artefacts and Images demonstrating Co-Design	Findings
		Workshop 3 with DTX members: Participants in DTX included individuals from Change Agent study and thought leaders in academic field provided Design Capability Model to review and provide feedback. Feedback shared by users in groups of 1-3 people and discussed with researcher Post-workshop 2: Feedback compared for common themes and patterns		organizations and academic institutions Competency Model is currently being prepared as an assessment tool for HCD learners in business schools of 2 large academic institutions and feedback will be received in 2018

Research question	Desired outcome	Procedure and Participants	Artefacts and Images demonstrating Co-Design	Findings
Does the microclimate model resonate with your experience? What can be done to make the Microclimate model more useful?	Assess transferability and value of micro-climate model to other healthcare organizations outside of the Innovation Catalyst network	Workshop 1 with ILN Participants: Researcher provided printed copy of Zuber, Moody, 2016 paper on Microclimates to participants and verbally summarized article. Discussion was facilitated by the researcher to capture applicability in users own organizational setting. Notes were captured and reviewed post workshop for themes.	 20th DMI: Academic Design Management Conference Inflection Point: Design Research Meets Design Practice Boston, USA, 22-29 July 2016 **Learning from the Best: Unpacking the Journey of Organizational Design Thinking Leaders** Christi DINING ZUBER[a], Louise MOODY[b] [a] Coventry University and Kaiser Permanente; [b] Coventry University *Organizationally empowered people who can successfully create teams of design thinkers to tackle long-term challenges, is a coveted situation in the design field. While research has primarily focused on the organizational level, little has focused on the individuals who have achieved this goal. Inspired by a personal journey as an internal practitioner, this study reveals experiences of individuals who have successfully set up design thinking practices within large organizations.* *Personal narratives were gathered using semi-structured interviews and personal journey maps. Multiple design thinking leaders from nine organizations ranging from healthcare to government to financial services reflect holistically on their own life story as well as their organizational experiences to leverage Design Thinking as an approach to innovation and creativity.* *These narratives were analyzed to surface seven common conditions and behaviors. These findings are discussed in more detail along with the fledgling theory of how these behaviors and surrounding supporting context form a "microclimate" within a larger organization, concluding that these approaches help enable the counter-culture design thinking approaches to occur. The study offers a set of learnings to inform and potentially elevate the practice of others seeking to understand and replicate their success.* ***Keywords:** design competency; organizational change; design thinking; internal practitioner; design leadership* Corresponding author: Christi Zuber zuberc@uni.coventry.ac.uk 	Categories included in Microclimate Model did resonate with individuals across industries. Microclimate Model needs to be more specific and actionable for HCD through an addition of guidelines or implementation approach (development of guidelines shown below)

Research question	Desired outcome	Procedure and Participants	Artefacts and Images demonstrating Co-Design	Findings
		Workshop 2 with DTX participants: Copy of Microclimate Model was provided to participants Discussion was facilitated by the researcher to capture applicability in users own organizational setting. Notes were captured and reviewed post workshop for themes.	 	Changes were made to high level category and sub category headers, as well as minor changes to descriptions to highlight main points. Additionally, "DT Expert" changed to "Change Agent" to distinguish from level of HCD expertise in Design Competency Model

Research question	Desired outcome	Procedure and Participants	Artefacts and Images demonstrating Co-Design	Findings
				There is a perceived value and application of model in across industry participants
What can be done to make the Microclimate model more actionable?	Increase value and application of Microclimate Model in healthcare	Workshop with Catalysts and Coaches: Participants provided Microclimate Implemenation Roadmap to review and provide feedback.		Categories overall resonated with participants.

Research question	Desired outcome	Procedure and Participants	Artefacts and Images demonstrating Co-Design	Findings
		Feedback shared individually in which each guideline was rated green, yellow or red to signal how closely it resonated with their own experiences. Feedback was consolidated into one form to visually show the categories which resonated the most (dark green) to those that were more mixed (light yellow). No category received a red rating.	  	Working of Microclimate implementation guidelines edited based on user feedback. Changes include color coding to visually align with Microclimate Model categories and minor description edits

Research question	Desired outcome	Procedure and Participants	Artefacts and Images demonstrating Co-Design	Findings
		Changes requested were consolidated into final Microclimate Model and implementation guidelines	  	

Appendix 2: Thought leader demographics

Affiliated organization	Practice Geography/ Location of Organization	Type of organization	Role	Gender	Years of experience in the field of study
IDEO	World-wide/ Headquarters in California, USA	Design and Innovation Consultancy	Partner	Male	26
Gravity Tank	Primarily USA/ Headquarters in New York, USA	Design and Innovation Consultancy	Practice leader	Male	9
University of Virginia - Darden Graduate School of Business	Primarily USA/ Based in Virginia, USA	Academic institution	Professor	Female	6
Stanford University- d.School	World-wide/ Based in California, USA	Academic institution	Director	Male	14
University of California at Berkeley- Haas School of Business	World-wide/ Based in California, USA	Academic institution	Professor	Female	9
Philadelphia University,	Primarily USA/ Based in	Academic Institution	Professor	Female	7

Strategic Design MBA	Pennsylvania, USA				
Chalmers University of Technology	Primarily Europe/ Based in Sweden	Academic Institution	Professor	Female	4
The Conference Board Fed-Ex	Primarily USA/ Based in New York, USA	Organization and Board Chair	Practice leader	Female	8
Consultant and Proctor and Gamble	World-wide/ Headquarters in Ohio, USA	Retired from organization leader and recent consultant	Retired practice leader and Consultant	Male	14

Appendix 3: Catalyst programme overview

Appendix 4: Catalyst in-person workshop observational protocol

Session name and time:		
Category of enabler	**Description of how enabler was demonstrated**	**Context or impact**
Advocate		
Partner		
Play/Trust		
Capacity building/Behavior change		

People/connections		
Scaffolding		
Storytelling		
Improvisation		
Other		